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DEVOTED TO GASTRO-ENTEROLOGY AND NUTRITION

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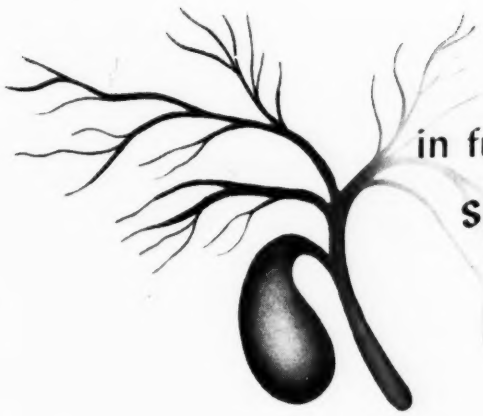

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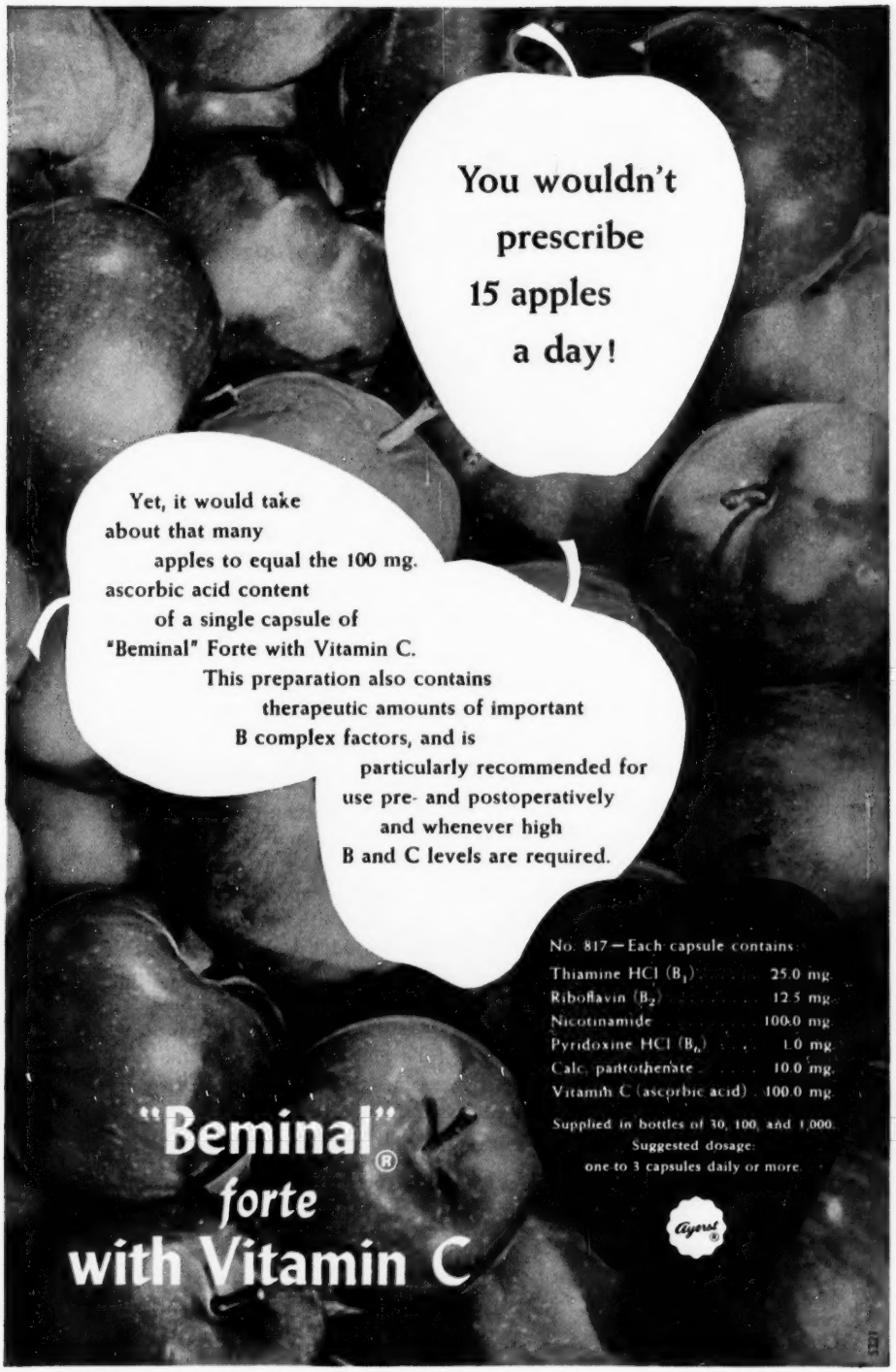
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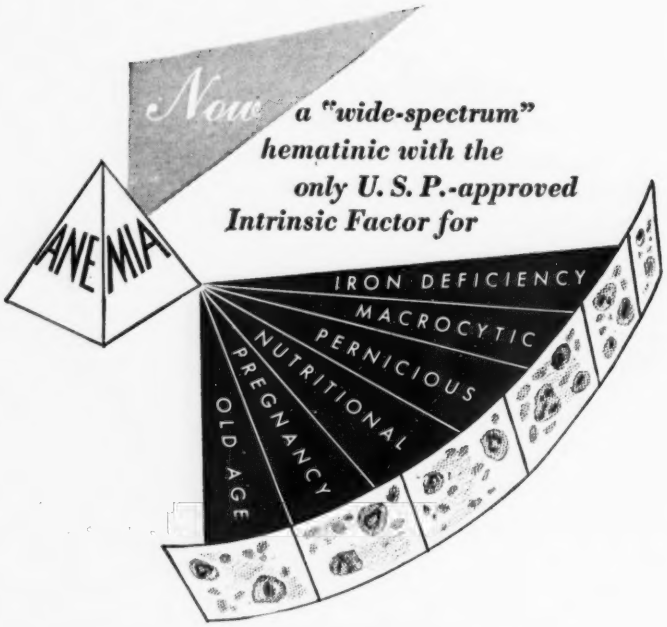

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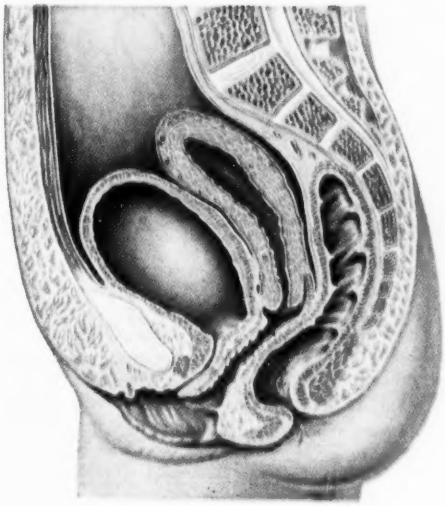

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1. Smith, F. H.: *Gastroenterology*, 8:394, Apr., 1947.
2. Woldman, E. E.: *Am. Jour. Med. Sc.*, 204:333, Sept., 1947.
3. Fox, J. R.: *Jour. Lancet*, 72:361, Aug., 1952.

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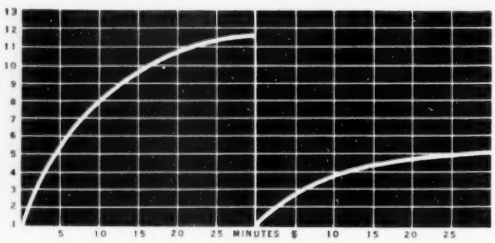

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REFERENCES

1. Ravdin, I. S., and Gimbel, N. S.: Protein Metabolism in Surgical Patients, J.A.M.A. *144*:979 (Nov. 18) 1950.
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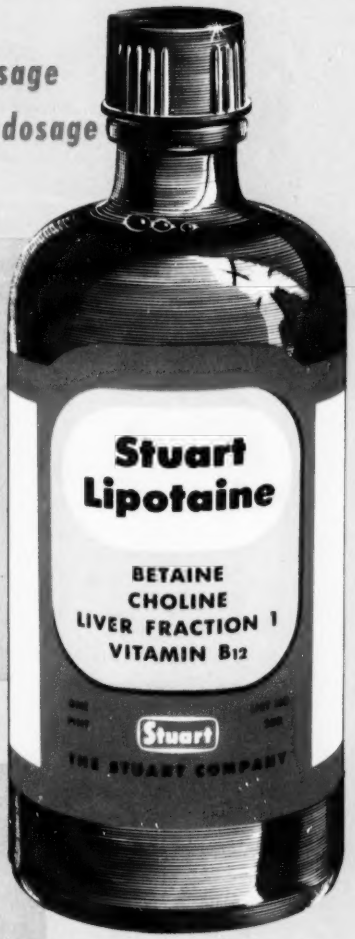

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THERAPY OF GASTRO-DUODENAL ULCERATIONS

M. B. Levin, M. D. and B. A. Gwynn, B. S., Baltimore, Md.

THIS ARTICLE is confined to the diagnostic and therapeutic methods that we have employed in gastric and duodenal ulcerative conditions. The distinct pattern herein described gradually evolved during the two decades that have elapsed since the original work was begun (1).

During the past 15 years ulcerative conditions involving the stomach and duodenum, other than the usual gastric and duodenal ulcers, have become more easily recognizable; in some cases through certain leading symptoms, and in others, only by x-ray. In practice they have been encountered in the following order of frequency:

1. The most common type of the ulcerative lesions encountered, frequently associated with occult bleeding of more than minimal quantity, was prolapsed gastric mucosa through the pyloric sphincter into the duodenum. Relatively more patients having prolapsed gastric mucosa, continued bleeding for a longer time than patients having the regular bleeding peptic ulcers, because of the persistent nervous tension. An occasional gastric or duodenal ulcer of the usual type (Fig. 1A) with or without the usual ulcer symptoms, was also delayed in healing when the patient was under prolonged tension. Yet the largest prolapsed mucosal case encountered (Figs. 1B & 1C) was cured as quickly as the smallest. The method of handling these cases was that used in regular ulcers except that antispasmodic medication (tincture stramonium, etc.) was administered to the fully effective or dry stage.

When occult bleeding in the stool was present and meat fiber digestion in the stool was 60% or less (hypochlorhydria), without any symptoms, prolapsed gastric mucosa was suspected (Figs. 1D & 2A). When pyloro-spastic symptoms were noted, with the stool showing meat fiber digestion in varying degrees from 80% to 90% (hyperchlorhydria) down to 60% or

Submitted Dec. 15, 1952.

Fig. 1A: (J. F.) Duodenal ulcer with hemorrhage. B: (F. M.) Large antral prolapse into duodenal bulb, A-P view. C: (F. M.) Same. P-A view. D: (C. J.) Prolapsed gastric mucosa into duodenum with hemorrhage.

less (hypochlorhydria) associated with occult bleeding, prolapsed pyloric mucosa was suspected (Fig. 2B). On occasions, pyloro-spastic symptoms were fluctuatingly accompanied by the usual peptic ulcer symptoms (Fig. 2C) and, at these peak periods, stools showed meat fiber digestion 80%-90%.

2. Next in frequency was diaphragmatic herniation of small or large segments of the stomach, occurring most commonly through the hiatus area. Herniations were relatively less frequently associated with occult bleeding than the first group mentioned, although pinching (or in fact any trauma) of a hollow viscus might result in bleeding. Diaphragmatic herniae, when symptomatic, often closely resembled gall-bladder or anginal attacks. These attacks were frequently precipitated on lying down or, even aroused the patient from sound sleep by pressure up into the chest, by tightness, etc. The symptoms were not infrequently relieved by having the patient sleep propped high or by Myanesin or by crushing the phrenic nerve. The large herniae were less apt to be symptomatic unless twisted. The stool showed variable meat fiber digestion, more stools showing below the normal 70% meat digestion than the hyperchlorhydric pattern, with or without accompanying occult bleeding. (Figs. 2D & 2E).

3. Rarer cases were diverticula (mostly congenital) of the duodenum (Figs. 3A & 3B), stomach, or of the diaphragmatic hernial portion of the stomach, and were usually associated with diverticula of other portions of the intestinal tract. These were commonly more prone to bleed than the preceding group. Ulcerations inside of a diaphragmatic hernia (Figs. 4A, 4B & 4C) or diverticulum, in contrast with the ordinary uncomplicated peptic ulcer, were months in healing because of the difficulty in reaching the ulcer effectively with the anti-digestive mixture.

4. Polyps of gastric or duodenal type (Figs. 5A, 5B & 5C) frequently bled and were asymptomatic unless associated with a regular ulcer, which actually produced the symptoms. At times, they were also associated with pyloro-spasm or partial obstruction, which were the symptomatic sources. In themselves, polyps did not produce laboratory evidence or symptoms but were incidentally found by x-ray.

5. The rarest variety seen was that termed Linitis Plastica. This was found to be the only epithelial type of malignant lesion (carcinoma) (Figs. 6A & 6B) which, from its aberrant or misplaced nest of carcinomatous cells, could spread far and wide in the deeper layers of the stomach and beyond, in all di-

Fig. 2A: (M. R.) Prolapsed gastric mucosa into duodenum with hemorrhage. B: (L. L.) Prolapsed gastric mucosa into duodenum and polyp; with pylorospastic symptoms. C: (J. L.) Prolapsed gastric mucosa with usual duodenal ulcer symptoms. D: (A. J. B.) Hiatus hernia with anginal symptoms. E: (A. C.) Hiatus hernia with gall-bladder symptoms.

rections, becoming inoperable before reaching the mucosal surface or communicating with the lumen of the gastro-intestinal tract. At this stage (Fig. 6A) it did not produce occult bleeding in the stool. However, after reaching the mucosal surface and communicating with the gastro-intestinal lumen (Fig. 6B) it did show occult bleeding. If Linitis Plastica of carcinomatous type happens to communicate early with the gastro-intestinal lumen, it will show occult bleeding in the stool, like other gastro-intestinal carcinomata. Gastro-intestinal carcinomata gave a greater than 99% positive blood reaction in the stool, (2, 3 and 4) and were, of course, surgical problems. The rare benign cases of Linitis Plastica seen, which were of chronic inflammatory ulcerative nature, required the same treatment as regular gastric ulcers, in addition to the treatment of the causative factors such as syphilis, tuberculosis, etc.

(NOTE:—Included in this group of ulcerative gastro-duodenal cases might be the lone case of benign hyperkeratosis of the cardio-esophageal mucosal junction, which was treated by injections of sclerosing solution just beneath the mucosa, in conjunction with the usual peptic ulcer therapy. Cardio-spasm was treated by dilatation. In this case, for a time, there was variable occult bleeding in the stool, a condition which has been absent for the past 3 years.)

Since our previous publications on peptic ulcer therapy (5 and 6), there have been minor modifications in handling the same, but basically it still revolved around the following 4 points:

A. *Anti-digestant:*

The anti-digestant employed consisted of magnesium trisilicate, calcium carbonate and dibasic ammonium phosphate. A few patients were encountered who could not tolerate any magnesium preparation and these had to use calcium carbonate in sufficient dosage, with or without one of the resins, in the same manner as the silicate of magnesium combination. In many cases the silicate combination tended to constipate the patient and mineral oil or vegetable mucus or gum was employed to combat this condition. The anti-digestant, of necessity, had to be present in the stomach before food was taken to protect the ulcer against the digestive action of the pepsin-HCl resulting from the stimulus of food. If the patient complained that the full dosage was too much to imbibe before meals, or that it spoiled his appetite, then part of the anti-digestant was taken before the meal and the balance was consumed either during or after it. It must again be stressed that at least part of the dosage had to be taken before meals and full dosage at bedtime.

B. *Anti-spasmodic:*

Tincture of Stramonium (or other anti-spasmodic) was employed, beginning with a dosage of 10 drops in water before meals, increasing 1 drop at each meal until the dry point was reached, when the dose was anchored at 1 drop less than the dry point.

Fig. 3A: (K. Y.) Duodenal diverticulum and hiatus hernia. B: (K. Y.) Duodenal diverticula and hiatus hernia.

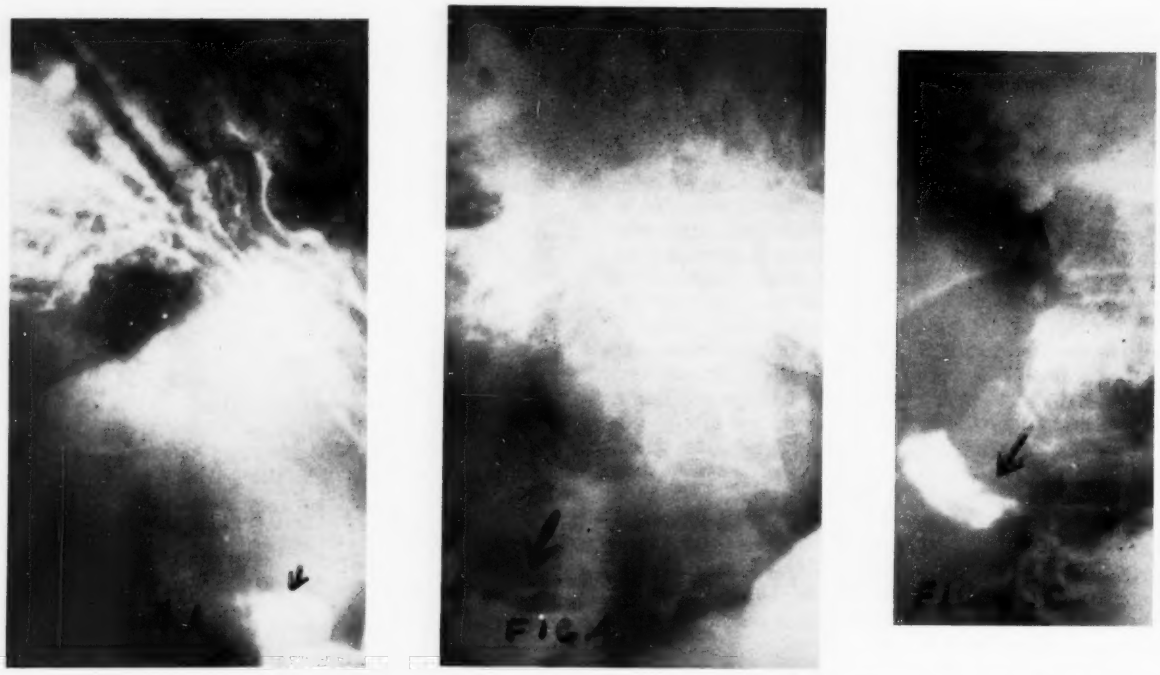

Fig. 4A: (R. E.) Diaphragmatic hernia with diverticulum (ulcerative) in hernia and duodenal ulcer. B: (R. E.) Same with better view of duodenal ulcer. C: Same with better view of gastric ulcerative diverticulum.

C. *The control of digestion as determined by stool examination:*

Control and maintenance of meat digestion at the 30% level as determined in the stool examination was important in healing the ulcerative conditions. At the same time, it permitted satisfactory nutrition of the patient by extra proteins and fats during the period necessary for the treatment.

D. *Use of correct diet.* See appendix.

In obstructive gastric or duodenal ulcers of the bleeding, penetrating and slow perforating types, the treatment, of necessity, in some instances, was prolonged beyond the usual time taken for hemostasis and healing. In order to heal the ulcerative conditions and at the same time permit satisfactory nutrition of the patient (with extra proteins) during the required period, we found that meat fiber digestion had to be reduced and maintained at the 30% level. The reason for only three good meals a day in our dietary regimen, in contrast to other dietary regimens employed in peptic ulcer therapy, was to permit digestive rest between meals and the proper neutralization of digestive activity during this period without the additional stimulation of gastric secretion by repeated between-meal feedings. The secretion of gastric juice is the physiological response of the stomach to all foods except water. The only exceptions to three regular meals a day were, temporarily, in cases of gastric retention and, permanently, in cases of gastric resection, where the gastric pouch was too small to hold sufficient nourishment for the patient in three meals, and where both medicine and food had to be given more frequently to maintain proper nutrition and healing effects.

In our dietary regimen in peptic ulcer therapy we again wish to emphasize that up to two or three times the normal quantity of animal protein (except cheese which on account of its lactose and lactic acid content, is limited to normal quantities), may be taken to maintain proper nutrition. Increased fats on vegetables and on bread are allowed if weight maintenance is a problem. We have removed our previous restriction of the acid containing foods such as tomatoes, sauerkraut, fruits, etc., during the initial 3 to 6 weeks, by adjusting the anti-digestant accordingly while allowing these foods. An additional contrast to other dietary regimens was that we did not mince or puree all foods, but (except during the active acute hemorrhage) gave meats, fish or fowl at least once or twice daily in the regularly eaten forms, either broiled, boiled, baked or roasted. Up to six or more eggs daily could be taken—boiled to any consistency, poached, or scrambled. Seafoods were allowed, prepared as above and on rare occasions, fried. Vegetables were given in either raw or cooked form. Fruits were preferably given fresh and raw instead of canned, cooked, etc., and were limited only by intestinal gas production and disturbance. Vegetable salads, raw or cooked, and mixed with added proteins, were given in preference to fruit salads. Cereals, grains and other starches, as well as milk and milk products, were limited to the patient's tolerance for the same reason. Soft drinks, chocolate milk, cocoa, fruit and vegetable juices and other sugar containing beverages were not allowed.

Effective dosage of anti-digestant before each meal and at bedtime was the most important thing to remember in the treatment of ulcerative gastric and duodenal conditions. The anti-digestant was begun at 2

Fig. 5A: (L. L.) Prolapsed gastric mucosa into duodenum with polyp. B: (L. B.) Pyloric ulcer with obstruction; duodenal polyp. C: (L. B.) Same. Release of obstruction after healing.

level teaspoonfuls before meals and at bedtime, and increased by 1 or 2 level teaspoonfuls at each meal and at bedtime in accordance with the patient's need to obtain relief from any or all symptoms, from one meal to the next and through the night. Two or three days after the patient was asymptomatic the stool was examined and if meat fiber digestion was not yet at the 30% level, the dose was increased by 1 to 2 level teaspoonfuls until this was achieved. Usually 12 weeks of top dosage was maintained, keeping meat digestion at 30% or less. Many ulcer cases (approximately 25%) after reaching 30% meat fiber digestion and improving or becoming asymptomatic, had release of the pylorospasm and reduction of edema or other obstruction. This allowed a secondary increase of pepsin-HCl, as evidenced by slight return of symptoms or a rise of meat digestion to 40% or more, and the anti-digestant had to be increased, at times to more than double the previous dose, before meals or bedtime to relieve the symptoms or reduce the meat digestion to the 30% level. After this 12 week period, if occult bleeding was absent, the dosage was decreased by 1 level teaspoonful each week, keeping meat digestion at 30% until the final discontinuation of the anti-digestant and antispasmodic. If after any reduction in the dosage of the anti-digestant, the meat digestion rose above 30% or symptoms recurred, the preceding dosage was reinstated for another week before attempting reduction. If symptoms recurred at any time following discontinuation of the medication during the first year, both medicines were reinstated for a varying period depending upon the need. Medication was also reinstated or increased when noticeable mucus was secreted into the stomach as a result of respiratory tract infections or other causes. It was also reinstated when occult bleeding reappeared. When ulcers had healed and medication was stopped, meat digestion was found to be at 60% or lower, despite previous high-points. If meat digestion rose to 70% or over, the assumption was that the ulcer was unhealed or irritated and medication was resumed for another short period.

Multiple ulcerations with obstructive lesions (polyps, edema, etc.) required patience as well as close dietary and laboratory control on the part of the patient and physician for as long as necessary and brought some unexpected rewarding results (Figs. 5B & 5C).

Posterior duodenal ulcers produced pain in any part of the abdomen from the lower portions to the chest, or in any part of the back, so that on occasions kidney stones were suspected as being responsible for the pain rather than the peptic ulcer. Slow perforation or leakage aided in masking the bizarre pattern of pain (Fig. 6C). On the other hand, as is well known, large hemorrhages occurred without any gastro-duodenal symptoms (Fig. 1A).

Acute active profuse hemorrhage was treated as follows: During the stage of hemorrhage, aside from anodynes, complete bed rest and the usual medication for hemorrhage, the patient was given 4 level teaspoonfuls of the anti-digestant powder in lukewarm water and a dosage of 2 level teaspoonfuls was repeated every hour for the first 8 to 12 hours. After this, 4 were administered before each nourishment and at bedtime and, if symptoms were present, increased to the level necessary for relief. The only foods given during the first 2 or 3 days of the acute stage of active hemorrhage were eggs, soft boiled or whipped into broths or bouillon, finely ground meats in clear soups, broths or bouillons with tea or water as the only beverages. After this the dietary ulcer regimen previously outlined was instituted.

Formerly aspirin or similar salicylates were noted (3) as possible factors in the production of ulcers in the normal healthy stomach and duodenum because of the desquamating or "corn-cure" effects of salicylic acid formed from them in the digestive juices and salicylic acid intensification of peptic digestion. These cases did not necessarily have the nervous or psychic elements as etiological factors, as seen in the production of peptic ulcers in 5 or 6 year old children. The possible prevention of the kerolytic "corn-cure" effects of salicylates might be aided by employment of a coating of high melting point food fat, grease or wax, soluble only in pancreatic lipase. (This coating could be made to withstand temperatures of 150° F. in travel through the tropics). Usual enteric coatings of salicylate tablets have not proved satisfactory, for occurrence and recurrence of ulcers resulted in spite of such enteric coatings. As a matter of fact, the use of casein or hemoglobin in testing the activity of peptic and tryptic materials is not too conclusive. Actually, such tests should be conducted on organized proteins such

Fig. 6A: (I. V.) Linitis plastica before reaching G.I. lumen. B: (I. V.) Same after reaching G.I. lumen. C: (J. S.) Duodenal ulcer with leakage; symptoms resembling kidney colic.

as meat fibers before testing them on the enteric coating and before deciding the value of such coatings (1).

The basis for tests employed to date in estimating gastric digestion by stool tests may be summed up as follows:

a. Transverse striations in voluntary muscle fibers are found in the sarcolemma of the living muscle fiber, and upon myocoagulation or rigor mortis of the individual fiber, are molded throughout the deeper sarcoplasm of the fiber (7).

b. While the deeper striations are molded in all types of voluntary muscle, they may be defective in possibly 10%-30% of fibers, particularly so in fish or other sea food. For this reason we usually make allowance for this percentage in describing complete achlorhydrias as 10%-30% in the stool test.

c. Pepsin-HCl combination normally is the only secretion which begins digestion of the meat fibers and pancreatic trypsin carries it further and increases the intensity in supportive digestive action. By itself, trypsin, either in acid or alkali media, does not begin this digestive action, even when in contact with the muscle fibers for weeks, or until bacterial decomposition disintegrates the fibers.

d. HCl itself does not trigger pancreatic trypsin nor does the alkali medium with trypsin do it without preceding pepsin HCl effects. This is noticed especially where pepsin-HCl is kept from contact with the normal duodenal mucosa by operative procedures for peptic ulcer. Pancreatic deficiency of external enzymes is manifested by insufficiency of tryptic digestion of muscle fibers and insufficiency of lipolytic action manifested by many free fats and some fatty acid crystals.

e. Post-operatively, at the site of the gastroenterostomy, recurrent ulcer formation frequently occurs because of the peptic and pancreatic action in combination with the acids of food or other acids when HCl is deficient.

SUMMARY

Diagnostic and therapeutic methods employed by us in ulcerative gastric and duodenal conditions were noted.

1. Cases of prolapsed gastric mucosa, in themselves,

had no specific symptomatology. The symptoms, if present at all, were the result of the accompanying pyloro-spasm, obstruction or of the regular peptic ulcerations sometimes accompanying the prolapse. Prolapsed gastric mucosa was suspected when occult bleeding with deficient varying meat digestion was found in the stool tests.

2. Diaphragmatic herniations, when symptomatic, usually had the symptoms accompanying the smallest hiatus herniae, and the distress usually occurred on lying down or during sleep, often resembling anginal or gallbladder type of symptoms. Occult bleeding, when noted, was associated with deficient or varying meat digestion resembling the prolapsed mucosal findings, and the localizing symptoms of the traumatized hollow viscus. The larger diaphragmatic herniae were usually asymptomatic except when twisted or when containing ulcers or diverticula with ulcerations, at which time symptoms of obstruction or gastric irritation might be present.

3. Diverticula of the duodenum and stomach in themselves were usually asymptomatic and might also be encountered accidentally when attention was drawn to them by the occult bleeding in the stool with varying meat digestion; and subsequent x-ray confirmation.

4. Gastric or duodenal polypi, in themselves, were not necessarily symptomatic unless they secondarily produced or were associated with pyloro-spasm, ulceration or obstruction. They did not produce symptoms or laboratory evidence. They were incidentally found by x-ray.

5. Linitis Plastica, the rarest type of the group discussed, when producing obstructive symptoms involving the stomach (or esophagus) at an early stage, might be found in the operable group of these cases. If the aberrant invading malignant cells reach the gastro-intestinal lumen early, causing occult bleeding in the stool, then x-ray confirmation can be obtained.

6. The anti-digestant combination was used before meals and at bedtime in sufficient dosage to relieve symptoms when present, and to keep meat fiber digestion at 30% as well as to stop occult bleeding in the manner described, in the gastro-duodenal ulcerations.

7. The important dietary regime was elaborated.

8. Certain complications including post-operative recurrent ulcers were discussed.

9. A suggestion for possible prevention of salicylate produced ulcers was noted.

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APPENDIX

CARBOHYDRATE CONTENT

(Clinical Classification)

5% Vegetables:

Artichokes (French)
Asparagus
Bamboo Shoots
Beans (string, snap, wax, soy bean sprouts)
Borage
Broccoli
Brussels Sprouts
Cabbage (plain, celery)
Capers
Cauliflower
Celeriac (turnip-rooted celery, tops)
Celery
Chard (Swiss)
Chayote
Chives
Collards
Corn Salad
Cress
Cucumbers
Dasheens (tops)
Eggplant
Endive (chicory, escarole)
Fennel
Greens (beet, dandelion, mangold, mustard, pokeberry, turnip)
Jews' mallow
Kale Sprouts
Kohlrabi
Leeks (not permitted)
Lettuce
Mushrooms
Okra
Orach (leaves and stems)
Parsley
Peppers (green or sweet)
Purslane
Radishes
Rhubarb
Romaine
Roquette (rocket salad)
Sauerkraut (as permitted)
Sea Kale
Sorrel or Dock (tops)
Spinach; Vinespinach (Basella)
Taro (tops)
Tomatoes
Udo
Vegetable Marrow

5% Fruits:

Citron
Grapefruit
Lemons
Limes

Olives

10% Vegetables:

Beets
Carrots
Lambsquarters
Onions (not permitted)
Oyster Plant
Pumpkin
Rutabaga
Squash
Truffles
Turnips

10% Fruits:

Alligator Pear (avocado)
Blackberries
Cantaloupe
Cranberries
Gooseberries
Loganberries
Loquats
Oranges
Papayas
Pineapple
Quinces
Sapote
Strawberries
Whortleberries

15% Vegetables:	Mulberries	20-30% (±) Miscellaneous:	Sorrel or Dock (roots)
Artichokes (Jerusalem)	Nectarines	Arrowroot	Tapioca
Beans (Lima—young, butter)	Peaches	Beans (baked, shell)	
Oca (tubers)	Pears	Canned Fruits (generally listed)	
Parsnips	Raspberries	Chocolate	
Peas (green)	Tangerines	Cocoa	
Soy Beans		Cocoanuts (generally listed)	60-80% Fruits (Dried):
15% Fruits:	20% (±) Fruits:	Cooked Grains (cereals)	Apples
Apricots		Corn (green)	Dates
Blueberries	Apples	Dasheens (tubers)	Figs
Cherries	Bananas	Jello	Peaches
Currants	Breadfruit	Legumes (generally listed)	Prunes
Dewberries	Haws	Lentils	Raisins
Figs (fresh)	Mamey Apple	Macaroni (boiled)	
Grapes	Mangos	Nuts (generally listed)	
Guava	Mangosteen	Peas (split, cooked)	
Huckleberries	Papaws	Potatoes (Irish, sweet)	
Kumquats	Persimmons	Rice (boiled)	
Melons (honeydew, musk, Persian, water)	Plums	Shallots (not permitted)	218 E. University Parkway.
	Prunes		

THE CHOLAGOGUE AND CHOLERETIC EFFECTS OF CERTAIN LAXATIVES WHEN INTRODUCED BY DUODENAL TUBE

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THE PURPOSE of this investigation was (1) to determine the cholagogue effects of the known laxative agents, aloes and podophyllum, magnesium sulphate and olive oil, when these substances were introduced by duodenal tube and (2) to determine the choleretic effect, in a series of cholecystectomized subjects, of aloes and podophyllum, when introduced in a similar manner.

A *cholagogue* causes evacuation of the gall bladder and expulsion of concentrated bile into the duodenum. A *choleretic* stimulates the secretion of bile by the liver and increases the concentration of the duodenal bile.

The method used in the cholagogue investigation was to perform a series of simultaneous 5 hour duodenal drainages and cholecystographic studies in a group of subjects with normally-functioning gall bladders. Quantitative studies were then made of the reduction in volume of the gall bladder and the concentration of certain constituents of the duodenal bile as determined in specimens collected after the initial hour of drainage and at the end of each hour following the installation of water and following stimulation with the test substances. In the choleretic investigation duodenal drainages were performed on a group of cholecystectomized subjects, continuing the drainages for 5 hours after stimulation. Quantitative studies were made of the same duodenal bile constituents, in the specimens collected at hourly intervals before and after a control substance (water) and before and after stimulation with aloes and podophyllum.

The methods described are in our opinion of greater clinical value than those previously used for the determination of cholagogue and choleretic effects. The volumetric reduction of the gall bladder can be determined with a high degree of accuracy (1). The concentration of the duodenal bile is of more practical significance than that obtained from a fistula or a common duct drainage tube. Results obtained in healthy ambulatory patients are preferable to those obtained in sick bed patients, particularly those recently subjected to operative procedures involving alterations in the biliary duct. Furthermore, conclusions based on cholagogue and choleretic studies in the experimental animal are not always applicable to the human being.

This study is also of practical value in that the laxative effects of the agents tested may be augmented by the amount of laxative bile salts introduced into the duodenum as the result of the cholagogue or choleretic action of the medication taken.

Physiological Considerations: To facilitate an evaluation of the results of this investigation, a brief review of the physiology of the normal liver and gall bladder is in order. The factors of greatest interest here are the bile constituents, i.e. bile salts, cholesterol and bilirubin. The *bile salts* are secreted by and derived exclusively from the liver (2). They are excreted in the bile and partially reabsorbed from the digestive tract, from which they are transmitted by the blood stream to the liver where they exert a choleretic effect. The *cholesterol* is mostly synthesized in the liver (3). It is partially esterified in the liver, from which it is transmitted to the blood and bile. Only free cholesterol is excreted in the bile. The *bilirubin* is only excreted by the liver cells; the exclusive extra-hepatic origin of the bilirubin is considered to be in the reticuloendothelial system (4).

Bile is secreted continuously by the liver. During periods of fasting it is diverted to the gall bladder, where it is concentrated approximately 4-10 times by the absorption of water by the gall bladder wall (5). The absorption of the solid constituents of the bile is variable and dependent upon the pathologic condition of the gall bladder wall. In the normal gall bladder wall there is no appreciable absorption of bile salts, cholesterol or bilirubin (5). The concentrated gall bladder bile is discharged into the duodenum by relaxation of the sphincter of Oddi and concomitant contraction of the gall bladder, in response to the stimulation of food or other agents.

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On the basis of known physiologic facts, a *cholagogue* effect should be demonstrated in this investigation by (1) a decrease in the volume of the gall bladder, as shown by cholecystographic shadows (2) an increased rate of flow of the solid bile constituents bile salts, cholesterol and bilirubin, and (3) an increased concentration of these constituents following stimulation with active cholagogue agents, as compared with control drainages. The *choleretic* effect, best demonstrable in cholecystectomized patients, should show a lesser but appreciable increase in the concentration of the bile constituents bile salts and cholesterol following stimulation with a choleretic agent, as compared with the effects of an inert substance. An increase in the bilirubin would not be anticipated, because this substance is shown to be of extra-hepatic origin.

The general plan of procedure in this investigation was: In the *cholagogue* investigation the effects of water introduced by duodenal tube (control drainages) were compared with those of aloes and podophyllum and with the effects of the known cholagogues magnesium sulphate and olive oil. The latter substances have been in use for many years in duodenal drainages, as evacuants of the gall bladder. The effects of these agents in causing evacuation of the gall bladder furthermore has been demonstrated by the simultaneous cholecystographic and duodenal drainage studies of Bockus and Gershon-Cohen (6). The cholagogue effect of olive oil and other fats in routine cholecystograms is well known. In the *choleretic* studies the effects of water introduced by duodenal tube was compared with that of aloes and podophyllum.

METHOD OF INVESTIGATION

Selection of Subjects: For this study men and women between the ages of 18 and 55 were selected. The fact that each was in good health was confirmed by a complete history, physical examination, urine, blood count, blood Wassermann and chemical blood examinations. In order to determine whether there was any significant difference in findings or response in those who repeatedly used laxatives, each subject was classified as non-laxative habituated or as laxative-habituated.

The presence of a normal gall bladder was established in each case by the cholecystogram, which was required to show both normal visualization and emptying, as well as the absence of any evidence of pathology such as stones. In the case of the cholecystectomized patients, the nature of the operation was established by a signed statement from the surgeon and/or hospital. The cholecystogram showed in each case no gall bladder shadow.

Duodenal Drainage: The method of performing the duodenal drainages was that originally described by Lyon (7), subsequently modified as described by Carter, Greene and Twiss (8). In these studies a bilumen gastric and duodenal tube was used, with continuous siphonage of the gastric secretion to avoid duodenal dilution.

The routine of duodenal drainage was carried out as follows: In the *non-laxative habituated* subjects the duodenal drainages performed were: (a) A control drainage (in 12 cases), in which a preliminary cholecystogram and the collection of a duodenal specimen of bile was followed by the introduction into the duodenal tube of 30 cc of water. Specimens of bile were then collected hourly over a period of 5 hours, during which serial cholecystograms were taken. (b) In all cases, similar duodenal drainages were performed, using as a stimulant 48 mg. of aloes and 12 mg. of

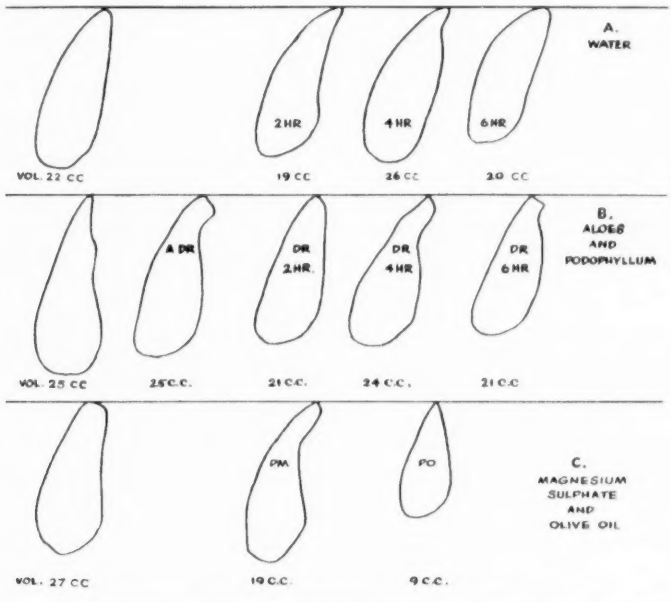

FIG. 1 [a] TRACINGS OF CHOLECYSTOGRAM SHADOWS TAKEN AFTER A. WATER B. ALOES AND PODOPHYLLUM C. MAGNESIUM SULPHATE (PM) AND OLIVE OIL (PO) [a] [a] SHOWN ½ ACTUAL SIZE

podophyllum in 30 cc of water. (c) A series of similar drainages were performed on the same subjects in which 30 cc of 33% magnesium sulphate and 30 cc of olive oil were used successively as stimulants.

In the *laxative habituated* group, only duodenal drainages (b) and (c) were performed.

The Cholecystogram: With each duodenal drainage there were carried out simultaneous cholecystographic studies. The evening preceding the drainage the patient was given 6 tablets of Priodax. A cholecystogram was made before each stimulation, after which serial cholecystograms were made. Tracings on transparent paper were later made of each gall bladder shadow. (Figure 1.) The volume of the gall bladder in each film was then computed by the method of Geraldo Siffert de Paula e Silva (1). Briefly speaking, this method consists in dividing the gall bladder shadow into a number of narrow transverse segments. The volume of each is computed on the basis of its measured diameter. The total volume of the gall bladder is the sum of the volumes of the individual segments.

Chemical Analyses: The chemical analyses of the duodenal bile were performed as follows: *Bile Salts* were determined by the method of Doubilet (9). *Cholesterol* content was determined by the method of Sperry and Schoenheimer, as described by Mattice (10). The *bilirubin* method of analysis was that of Van den Bergh (11).

All findings were checked statistically. Tests of significance of difference were based on standard tables of the distribution of "t."

GALL BLADDER SERIES

In this series there were 31 subjects, 25 women and 6 men. An effort was made to determine whether there were any significant differences in the findings or reactions of those subjects with and without a history of taking laxatives regularly. For this purpose 14 subjects were selected who had no symptoms of constipation, upon whom 12 drainages were performed using only water and 12 drainages were performed using as a stimulant aloes and podophyllum. There were 17 subjects who were habitual and regular users of laxatives; in each of this group both types of drainages were performed. The actual numbers of drainages performed in each group are shown in Table 1.

TABLE I

AVERAGE VOLUME (cc) OF GALL BLADDER IN SUBJECTS BEFORE AND AFTER WATER (CONTROLS) AND BEFORE AND AFTER STIMULATION WITH VARIOUS TESTING AGENTS

	Before Stimulation	After Stimulation	Reduction in Volume		Increase in Reduction Over Controls	
	cc	cc	cc	%	cc	%
Controls (H_2O)	34.6	28.6	6.0	17.3	—	—
No. of Subjects	(12)	(12)				
Aloes & Podophyllum	44.4	33.7	10.7	24.1	4.7	78.6
No. of Subjects	(28)	(28)				
Magnesium Sulphate	42.4	35.7	6.7	15.8	0.7	11.5
No. of Subjects	(26)	(26)				
Olive Oil (After $MgSO_4$)	35.7	21.3	14.5	40.5	8.5	141.0
No. of Subjects	(26)	(26)				

The results of the investigation in this group were as follows:

Volume of the Gall Bladder: In accordance with the method described, the volume of the gall bladder was computed from the cholecystograms before and after the use of the various stimulants. Typical tracings of the gall bladder shadows in individual subjects before and after stimulation with the various agents are shown in Figure 1. It is here noted that there was slight reduction in size of the gall bladder following the introduction of water into the duodenal tube. An appreciable reduction occurred after aloes and podophyllum and after magnesium sulphate, a striking reduction after olive oil.

The average volume of the gall bladder, before and after stimulation with the various agents, is shown in Table 1. It is here seen that magnesium sulphate resulted in slightly more evacuation of the gall bladder than was found in the control series. The increased contraction over the control series following magnesium sulphate was 11.5%, after aloes and podophyllum 78.6%, after olive oil 141.0%.

TABLE II

THE AVERAGE RATE OF OUTPUT OF DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER HOUR, BEFORE AND AFTER WATER (CONTROLS) AND BEFORE AND AFTER STIMULATION WITH VARIOUS TESTING AGENTS

	Bile Salts (Mg. per Hr.)				Cholesterol (Mg. per Hr.)				Bilirubin (Mg. per Hr.)			
	Before	After	Diff.	% Incr.	Before	After	Diff.	% Incr.	Before	After	Diff.	% Incr.
Controls (H_2O)	61.3	41.2	−20.1	−32.8	14.1	9.7	−4.4	−31.5	1.67	1.50	−0.17	−10.4
No. of Subjects	(10)	(10)			(10)	(10)			(10)	(10)		
Aloes & Podophyllum	54.6	69.0	14.4	26.4	17.5	22.6	5.2	29.7	1.36	3.49	2.13	156.2
No. of Subjects	(28)	(29)			(28)	(29)			(28)	(29)		
Magnesium Sulphate	70.3	224.2	153.9	218.8	11.5	42.0	30.5	265.6	1.51	11.22	9.70	640.6
No. of Subjects	(25)	(24)			(25)	(24)			(26)	(25)		
Olive Oil (After $MgSO_4$)	70.3	332.4	262.0	372.5	11.5	45.9	34.4	299.4	1.51	11.99	10.48	692.0
No. of Subjects	(25)	(22)			(25)	(22)			(26)	(23)		

TABLE III

AVERAGE RATE OF OUTPUT OF DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER HR., AFTER WATER (CONTROLS) AND AFTER STIMULATION WITH VARIOUS TESTING AGENTS

	Bile Salts			Cholesterol			Bilirubin		
	Mg. per Hr.	Increase Over Controls		Mg. per Hr.	Increase Over Controls		Mg. per Hr.	Increase Over Controls	
		Mg./hr.	%		Mg/hr.	%		Mg/hr.	%
Controls (H_2O)	41.2			9.7			1.5		
No. of Subjects	(10)			(10)			(10)		
Aloes & Podophyllum	69.0	27.8	67.3	22.6	13.0	134.1	3.5	2.0	133.3
No. of Subjects	(29)			(29)			(29)		
Magensium Sulphate	224.2	183.0	444.0	42.0	32.3	334.6	11.2	9.7	649.0
No. of Subjects	(24)			(24)			(25)		
Olive Oil (After MgSO)	332.4	291.1	706.2	45.9	36.3	374.8	12.0	10.5	700.9
No. of Subjects	(22)			(22)			(23)		

It is of interest to note that the average gall bladder volume was greatest in the laxative-habituated group, 48.4 cc as contrasted with 35 cc in the non-laxative habituated group.

The reduction in volume of the gall bladder following stimulation was essentially similar in both the laxative-habituated groups following aloes and podophyllum and olive oil.

DUODENAL BILE CONSTITUENTS

Output: Before and after introduction into the duodenum of water (control series) and before and after introduction of the testing agents (test series) specimens of bile were obtained for analysis at hourly intervals. The drainage was continued for 5 hours after the use of a stimulant. The bile constituents determined in each hourly specimen, were the bile salts, cholesterol and bilirubin.

In Table 2 is shown the rate of output of the bile constituents tested giving the average figure for each in mg per hour before and after water or a testing agent. Findings are recorded for the control series and for each of the agents tested. It is here seen that there was an average actual decrease in the output of all bile constituents in the control drainages.

Aloes and podophyllum resulted in an appreciable increase in the output of bile salts (26.4%) and cholesterol (29.7%). There was a greater increase of bilirubin (156.2%). Following *magnesium sulphate* there was a comparable but considerably greater response in all bile constituents. *Olive oil* gave the highest increase in output of all constituents, the cholesterol increase being relatively less than the bile salts and bilirubin.

The efficacy of the various agents tested in causing an output of bile constituents greater than that found in the control series was further confirmed by a comparative study of the mg per hour output of each constituent, following the use of water and following the various agents. The findings in Table 3 indicate that there was an appreciable increase in the output of all bile constituents, following the use of each of the testing agents. Following aloes and podophyllum, the output of bile salts was increased 67.3%, that of cholesterol 134.1%, that of bilirubin 133.3%. Following magnesium sulphate and olive oil, the increases in output of the bile constituents were comparable to those shown in Table 2.

In general, these findings are consistent with the maximum degree of gall bladder evacuation following olive oil which was demonstrated in the cholecystographic studies. The variability in the increased output of the various bile constituents with lesser degrees of gall bladder evacuation is probably due to larger proportional amounts of liver bile. Other possible factors, probably of lesser importance, are (1) a selective response of the liver in regard to the output of various constituents of the bile or (2) a slightly different rate of absorption of the various bile constituents by the gall bladder wall.

TABLE IV

THE DIFFERENCE IN AVERAGE CONCENTRATION OF DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER CENT, BEFORE AND AFTER WATER (CONTROLS) AND BEFORE AND AFTER STIMULATION WITH VARIOUS TESTING AGENTS. THE CONCENTRATION AFTER STIMULATION IS THE MAXIMUM OBTAINED

	Bile Salts (Mg. Per Cent)				Cholesterol (Mg. per Cent)				Bilirubin (Mg. Per Cent)			
	Before	After	Diff.	% Incr.	Before	After	Diff.	% Incr.	Before	After	Diff.	% Incr.
Controls (H_2O)	130.2	150.0	19.8	15.2	3.02	33.3	3.1	10.3	3.68	5.99	2.31	62.9
No. of Subjects	(10)	(10)			(10)	(10)			(10)	(10)		
Aloes & Podophyllum	124.9	248.5	123.6	98.9	39.0	71.1	32.1	82.4	3.52	13.15	9.63	273.2
No. of Subjects	(29)	(29)			(29)	(29)			(29)	(29)		
Magnesium Sulphate	131.8	366.4	234.6	178.0	29.5	61.7	32.2	109.2	2.76	14.04	11.28	408.9
No. of Subjects	(26)	(25)			(26)	(25)			(26)	(25)		
Olive Oil (After $MgSO_4$)	131.8	504.5	372.8	282.8	29.5	78.3	48.8	165.7	2.76	18.76	16.00	579.8
No. of Subjects	(26)	(23)			(26)	(23)			(26)	(23)		

TABLE V

THE DIFFERENCES IN AVERAGE CONCENTRATION OF THE DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER CENT, AFTER WATER (CONTROLS) AND AFTER STIMULATION WITH VARIOUS TESTING AGENTS

	Bile Salts			Cholesterol			Bilirubin		
	Mg. per Cent	Increase Over Controls		Mg. Per Cent	Increase Over Controls		Mg. Per Cent	Increase Over Controls	
		Mg.%	%		Mg.%	%		Mg.%	%
Controls (H_2O)	150.0			33.3			5.99		
No. of Subjects	(10)			(10)			(10)		
Aloes & Podophyllum	248.5	98.5	65.7	71.1	37.4	112.5	13.15	7.16	119.6
No. of Subjects	(29)			(29)			(29)		
Magnesium Sulphate	366.4	216.4	144.3	61.7	28.4	85.4	14.04	8.05	134.5
No. of Subjects	(25)			(25)			(25)		
Olive Oil (After $MgSO_4$)	504.5	354.5	236.4	78.3	45.1	135.4	18.76	12.77	213.3
No. of Subjects	(23)			(23)			(23)		

Concentration: Further analyses were made of each specimen of bile, before and after stimulation, to determine the concentration of each of the bile constituents. In Table 4 is seen the difference in the average concentrations of each, before and after the use of water and the different agents. Following stimulation, the maximum concentration obtained in each case is reported.

Aloes and podophyllum was again found to increase to a moderate extent the concentration of bile salts (99%) and cholesterol (82%), with a greater increase of bilirubin (273%). *Magnesium sulphate* again gave a higher concentration of each constituent, the degree roughly paralleling that found in the increased rate of output of each constituent. *Olive oil* again proved most efficient in increasing the concentration of each of the bile constituents.

A comparative study of the maximum concentration of the various bile constituents following the use of water and following the use of various testing agents is shown in Table 5.

It is here seen that with aloes and podophyllum the increase in concentration over that of the controls of bile salts was 65.7%, of cholesterol 112.5%, of bilirubin 119.6%. Following magnesium sulphate there was a greater increase in the concentration of bile salts (144.3%) and bilirubin (134.5%), but a lesser increase in the concentration of cholesterol (85.4%). After olive oil there was a further increase in the concentration of all constituents, the degree of increased concentration was similar for each of the constituents.

CHOLECYSTECTOMIZED SUBJECTS

In the group selected for investigation following cholecystectomy there were 41 individuals, all women. The ages varied from 21 to 55 years. Of this group, 21 were not habitual laxative users and 20 were laxative-habituated. There were few significant differences in findings in these two groups.

Of these 41 subjects, 38 had duodenal drainages in which the instillation of 30 cc of water by duodenal tube was followed by a period of 5 hours drainage of duodenal bile. Specimens of bile were obtained during each hourly period and analyzed for bile salts, cholesterol and bilirubin.

Of these 41 subjects, 38 had duodenal drainages in which the instillation by duodenal tube of 48 mg of aloes and 12 mg of podophyllum dissolved in 30 cc of water was followed by a period of 5 hours drainage of duodenal bile. 29 of these 38 subjects were identical with 29 of the 32 subjects who received the water instillation.

It is recognized that there may be following cholecystectomy a dilatation of the bile ducts, which can take over to some degree the concentrating power previously exercised by the gall bladder. In order to obviate the possibility of this condition affecting the concentration of bile after water or aloes and podophyllum, (1) no subject was selected in whom the cholecystectomy had been performed longer than 2 years previous to the investigation, and (2) previous to the introduction of water or aloes and podophyllum, the bile ducts were drained by siphonage.

The results of the use in control and test groups of water and aloes and podophyllum as a stimulating agent are shown in Tables 6 and 7. The factors shown are again the rate of excretion and the concentration of the various bile constituents. In view of the fact that these subjects had lost the concentrating mechan-

TABLE VI

CHOLECYSTECTOMIZED SUBJECTS: THE DIFFERENCES IN AVERAGE RATE OF OUTPUT OF DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER HOUR, AFTER WATER (CONTROLS) AND AFTER STIMULATION WITH ALOES AND PODOPHYLLUM

	Bile Salts			Cholesterol			Bilirubin		
	Mg. per Hr.	Increase Over Controls		Mg. per Hr.	Increase Over Controls		Mg. per Hr.	Increase Over Controls	
		Mg.%	%		Mg/hr.	%		Mg./hr.	%
Controls (H_2O)	51.8			28.8			4.6		
No. of Subjects	(32)			(32)			(32)		
Aloes & Podophyllum	58.4	6.6	12.7	31.3	2.5	8.65	2.3	–2.3	–50.4
No. of Subjects	(38)			(38)			(38)		

TABLE VII

CHOLECYSTECTOMIZED SUBJECTS: THE DIFFERENCES IN AVERAGE CONCENTRATION OF DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER CENT, BEFORE AND AFTER WATER (CONTROLS), AND BEFORE AND AFTER STIMULATION WITH ALOES AND PODOPHYLLUM. THE CONCENTRATION AFTER STIMULATION IS THE MAXIMUM OBTAINED

	Bile Salts (Mg. %)				Cholesterol (Mg. %)				Bilirubin (Mg. %)			
	Before	After	Diff.	Increase Over Controls Mg.%	%	Before	After	Diff.	Increase Over Controls Mg.%	%	Before	After	Diff.	Increase Over Controls Mg.%	%
Controls (H_2O) No. of Subjects	134.3 (32)	165.1 (32)	30.9			88.23 (32)	121.89 (32)	33.66			7.82 (32)	17.55 (32)	9.74		
Aloes & Podophyllum No. of Subjects	129.9 (38)	178.3 (38)	48.4	17.5	56.8	76.53 (38)	127.56 (38)	51.03	17.37	51.6	3.79 (38)	8.15 (38)	4.36	-5.37	-55.2

ism of the gall bladder, it was to be anticipated that the output and concentration of the bile constituents would be considerably less than those found in the subjects with normally functioning gall bladders. Inasmuch as the rate of excretion and the concentration of bile salts and cholesterol reflect the secretory and metabolic activity of the liver, an appreciable increase in these determinations would indicate a choleretic effect on the part of any testing agent. The bilirubin rate of excretion and concentration, however, would not be affected because this substance originates outside the liver and is merely excreted by this organ.

As shown in Table 6, the increased rate of output over the control which followed the use of aloes and podophyllum was very moderate in the case of bile salts (12.7%) and cholesterol (8.65%). Undoubtedly due to factors of dilution, there was an actual decrease in the output of bilirubin following stimulation with aloes and podophyllum.

The concentrations of the biliary constituents, before and after water and before and after stimulation with aloes and podophyllum are shown in Table 7. It is here seen that as compared with the controls there was a greater increase following aloes and podophyllum of the bile salts (56.8%) than the increase of 51.6% for cholesterol. Again there was a decrease in the concentration of bilirubin following stimulation with aloes and podophyllum.

Inasmuch as there were certain differences in the maximum concentrations of duodenal bile following aloes and podophyllum in the laxative-habituated and non-laxative habituated groups of subjects, these data are summarized in Table 8.

It is here seen, for example, that following stimulation with aloes and podophyllum, the average maximum bile salt concentration in the non-laxative habituated group (46.8%) was almost double that of the laxative-habituated group (29.4%). This fact would seem to indicate that aloes and podophyllum had a greater choleretic effect in the non-laxative habituated group.

The choleretic effect of an agent producing in the duodenal bile a maximum increase in the output of bile salts and a decrease in the output of bilirubin in the cholecystectomized subjects affords an interesting contrast to the effect of the cholagogue agents, which in the subjects with a normally-functioning gall bladder produced in all cases a maximum increase in the output and concentration of bilirubin, as compared with the concentrations of bile salts and cholesterol.

SUMMARY AND CONCLUSIONS

1. An investigation was made of the cholagogue and choleretic properties of the laxative agents aloes and podophyllum, magnesium sulphate and olive oil.

2. For the cholagogue investigation, a series of healthy subjects having normally-functioning gall bladders were studied by means of simultaneous duodenal drainages and serial cholecystographic studies.

3. Each of the agents tested was found to have cholagogue properties, as was shown by (1) a significant reduction in volume of the gall bladder and (2)

TABLE VIII

CHOLECYSTECTOMIZED SUBJECTS: AVERAGE DIFFERENCE IN THE CONCENTRATIONS OF DUODENAL BILE CONSTITUENTS, EXPRESSED IN MG. PER CENT, BEFORE AND AFTER WATER (CONTROLS) AND BEFORE AND AFTER STIMULATION WITH ALOES AND PODOPHYLLUM IN GROUPS OF NON-LAXATIVE HABITUATED AND LAXATIVE-HABITUATED SUBJECTS

	Bile Salts (Mg. %)				Cholesterol (Mg. %)				Bilirubin (Mg. %)			
	Before	After	Diff.	% Incr.	Before	After	Diff.	% Incr.	Before	After	Diff.	% Incr.
Laxative Habituated												
Controls (H_2O)	132.6	156.2	23.6	17.8	102.97	137.71	34.74	25.2	5.065	8.578	3.513	69.4
No. of Subjects	(14)	(14)			(14)	(14)			(14)	(14)		
Aloes & Podophyllum	135.3	175.1	39.8	29.4	79.78	132.18	52.40	65.7	4.176	9.399	5.223	125.1
No. of Subjects	(20)	(20)			(20)	(20)			(20)	(20)		
Non-Laxative Habituated												
Controls (H_2O)	135.5	172.1	36.6	27.0	76.76	109.58	32.83	42.8	9.957	24.532	14.575	146.4
No. of Subjects	(18)	(18)			(18)	(18)			(18)	(18)		
Aloes & Podophyllum	123.9	181.9	58.0	46.8	72.93	122.43	49.50	67.9	3.366	6.769	3.404	101.1
No. of Subjects	(18)	(18)			(18)	(18)			(18)	(18)		

a significant increase in the rate of output and concentration of the duodenal bile constituents, i.e., bile salts, cholesterol and bilirubin.

4. For the choleretic investigation, cholecystectomized patients were subjected to duodenal drainage. A comparative study was made of the rate of output and concentrations of the duodenal bile constituents bile salts, cholesterol and bilirubin, before and after the introduction by duodenal tube of (1) water (control series) and (2) aloes and podophyllum.

5. In the cholecystectomized subjects, aloes and podophyllum were found to have choleretic properties as shown by (1) an appreciable increase in the rate of output of bile salts and cholesterol and (2) a significant increase in concentration of the same substances, following stimulation with the testing agent.

6. The methods of investigation described for the determination of the cholagogue and choleretic properties of a given agent are considered to be of greater clinical significance than the results obtained in patients recently subjected to operative procedures on the biliary tract or those obtained in experimental animals.

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OBSERVATIONS ON OBESITY: SUBJECTIVE IMPRESSIONS OF 108 CONSECUTIVE PATIENTS AS TO THE CAUSES OF THEIR OBESITY

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THE CAUSE of obesity is conceded by most investigators to be an excessive caloric intake. However, many observers believe that other factors such as glandular dysfunction, metabolic peculiarities, and heredity play important roles. It was thought that it may be of some interest to get the patients' viewpoint as to why they thought they were obese.

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Submitted Dec. 3, 1952.

MATERIAL AND METHODS

This survey was conducted among all new admissions to the Obesity Clinic of the Welfare Island Dispensary, Metropolitan Hospital Division. During the past 8 months, 108 new patients were admitted to the clinic, and their answers to our questions form the basis of this report. All these patients were asked the following questions:

1. Why do you think you are overweight?
2. How long have you been overweight?
3. Was there any event in your life which you feel

caused you to become overweight? (Precipitating cause)

4. How is your appetite, and how well do you eat? These patients were questioned at the time of their first visit to the clinic when their histories were taken. Consequently they were not influenced by our views and thus give answers they thought we might want to hear rather than their own opinions.

All except 3 of the 108 patients were women. Their ages ranged from 13 to 69 years, averaging 41 years. All patients under 13 years were admitted to the pediatric division, consequently we had no opportunity to observe obese children. The age distribution of these patients is summarized in Table I. They were divided

TABLE I

AGE DISTRIBUTION OF GROUP STUDIED

Age	Number
13 to 19	5
20 to 39	44
40 to 50	41
over 50	18
Total	108

into the following groups: the period of adolescence and development (13 to 19 years), usual childbearing years (20 to 39), menopausal period (40 to 50 years), and the period of waning activity and vigor (over 50 years).

The lengths of time these patients admitted being overweight are summarized in Table II. In spite of

TABLE II

DURATION OF OBESITY

Years	Number
0-5	31
6-10	17
11-20	23
over 20	8
many	29
Total	108

efforts to get a specific answer, 29 patients could give no more definite time than "many years."

RESULTS

The primary reasons for their obesity, as admitted by these 108 patients, are summarized in Table III. Half of the patients readily admitted they were obese because they ate too much. Although the remaining patients attributed their obesity primarily to various other causes, a third of them admitted overeating.

Only 49 patients were able to date the onset of their obesity from some specific event or events. (Table IV).

TABLE III

PATIENTS' REASONS FOR CAUSE OF OBESITY

Cause	*Dietary Factor Implicated*	*Number*	*Percent*
Dietary (Primary)	54	54	50%
Unknown		24	21
Admit overeating	9		
Surgical Procedures		9	8
Admit overeating	2		
Pregnancy		8	7
Admit overeating	4		
Heredity		7	6
Admit Overeating	2		
Menopause		3	3
Inactivity		2	2
Multiple Illnesses		1	1
"Glands"		1	1
Thyroid Condition		1	1
Total	71 (65%)	110*	100%

*2 subjects attributed their obesity to 2 primary factors.

TABLE IV

PRECIPITATING CAUSES OF OBESITY

Cause		*Number*
Pregnancy		23
Surgical Procedures		18
Appendectomy	2	
Hysterectomy	8	
Thyroidectomy	2	
Hemorrhoidectomy	1	
Dental Extractions	1	
Ankle Fusion	1	
D & C	1	
Cholecystectomy	1	
Undisclosed	1	
Medical Illnesses		5
Pneumonia	2	
Back injury	1	
Worries	1	
Asthma	1	
Menopause		5
Natural	2	
Surgical	3	
Miscellaneous		2
Arrival in U. S.	1	
Marriage	1	
Total		53
No. with 2 causes		4
No. of patients identifying a precipitating factor		49

Pregnancy and surgery formed the bulk of these precipitating factors.

DISCUSSION

The results of this study were of considerable surprise to us. It is a natural tendency for individuals to attribute their shortcomings to factors over which they have no control, thus absolving themselves of personal blame. This feature has been mentioned by

several investigators (1, 2, 3). Yet, only 18% of these patients questioned attributed their obesity to such factors as pregnancies, heredity, the menopause, or glandular disturbances; conditions which are popularly cited as usual causes of obesity. And even in this relatively small group, one-third of these patients also admitted they over-ate. Twenty-four patients (21%) had no opinion as to why they were overweight, yet 37½% of this group admitted dietary excesses.

The precipitating cause of obesity obviously was not considered the primary cause in most instances. Of 49 patients who dated the onset of obesity to some such event as pregnancy, surgery, or the menopause, only 20 patients listed these factors as the primary cause of their obesity.

The duration of obesity of each patient was recorded as told us by the patient. The reliability of these data is questionable. Many patients probably just guessed at some figure. Also the definition of obesity varies with different individuals. On close questioning, some patients weighing more than 200 pounds stated they were obese for a certain time, before which they weighed only about 180 lbs., which they considered their normal weight.

SUMMARY

One hundred and eight consecutive obese patients were asked why they thought they were overweight. Fifty percent of this group readily admitted that the reason for their obesity was dietary excesses. An additional 15%, although blaming their obesity primarily on other factors, admitted overeating. Popularly held reasons for obesity such as pregnancies, the menopause, heredity and glandular disturbances accounted for only 18% of the answers.

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DIVERTICULOSIS INTESTINI AND PERNICIOUS ANAEMIA

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IN 1897 K. FABER described the coincidence of pernicious anaemia and multiple intestinal stricture, and emphasized the possibility of a relationship between them. Later on several similar cases have been published. Most important among them is *Meulengracht's* review of 22 cases from 1929, and *Barker & Hummels* work from 1939 consisting of 49 cases collected from literature plus two personal contributions. *Cameron, Watson and Witts* reviewed the literature in 1949, commenting on 60 cases and one personal. The latter was a case where macrocytic anaemia followed after anastomosis to shortcircuit a stricture due to regional ileitis. There was no effect after parenteral treatment with potent liver extract.

From this article the following Table No. I with analysis of 61 cases and one personal case is reproduced.

In 23 cases anaemia followed after an operation of anastomosis, in 37 single or multiple strictures were found, and one case only presented multiple diverticulosis. As this last feature seems to be rare, the following description of a new case may be of interest.

The patient, a business man born in 1885, has been treated in our department on two occasions. Firstly from the 10th of January to the 2nd of February 1949 for diverticulosis intestini et duodeni, hypervolume anaemia and Bechterews disease. The second time was from the 13th of January to the 25th of February 1950 under the same diagnosis plus nephrocholelithiasis.

His case history reveals dyspeptic trouble for 30 years, interrupted by occasional improvement on strict diet. The symptoms are not related to different seasons of the year. The pain is localized to the epigastric region, radiating to the right of the abdomen and backwards. It seems to occur chiefly after hard work during the afternoon, and occasionally even at night. Coffee and fried fat are badly tolerated. He suffers from pyrosis, and now and then from vomiting. He had a big loss of weight before his first admittance.

In 1939 he was treated dietetically in the University Clinic of Oslo with a favorable result. On x-ray examination at this time there was found a deformity of the duodenal bulbus. There is a severe constipation. Interval of stool 4 to 5 days.

The patient looked pale and sick. The vertebral column was completely stiff in its entire length.

TABLE I

ANALYSIS OF 61 PLUS ONE PERSONAL CASE OF INTESTINAL STRICTURE OR ANASTOMOSIS WITH A PICTURE OF ANAEMIA RESEMBLING PERNICIOUS ANAEMIA

	Present	Absent	Not Recorded
Gastro-intestinal symptoms	53	2	7
Glossitis	34	6	22
Neurologic disease	12	20	30
Icterus	19	20	23
Macrocytosis	50	1	11
Hyperchromia	42	11	9
Poikilocytosis	25	...	37
Leukopenia	36	7	19
Free HCL in gastric juice	14	20	17

From the Medical Department, St. Josephs Hospital, Porsgrunn, Norway. Chief: A. Schrumpf.

Submitted Dec. 2, 1952.

Hemoglobin: 63 per cent (Haldanes standard).
Red blood corpuscles 2.38×10^6 per cu. mm.
Colour index 1.2.
Volume per erythrocyte: 100 cubicmicron.
White bl. corpuscles: 5,200. The counting revealed slight lymphocytosis and distinct hypersegmentation.
Thrombocytes 287,000 per cu. mm.
Sedimentation rate: 39 mm.

Sternal marrow puncture: 92,800 cells per cu. mm. There was a distinct megaloblastic hyperplasia with many figures of nuclear division in meta- and telophase.

Diagnosis: Pernicious anaemia highly probable.

Gastric test meal: Positive Congo reaction.

There was a negative benzidine test on the stool.

X-ray examination of the stomach and vertebral column: Deformity of the duodenal bulbus with rapid filling and emptying.

There are several diverticles in the jejunum and ileum, probably with retention in the biggest diverticle. Bechterews disease in the vertebral column.

There was in this case a hypervolume anaemia with all the findings characteristic of pernicious anaemia, except free hydrochloric acid in the stomach. Iron treatment was started with a daily dose of 1.50 gm. reduced iron. The effect was somewhat slow but sufficient, as can be judged from the hemoglobin rise.

Date	Hb per cent	Date	Hb per cent
Jan. 10	63	Jan. 31	76
Jan. 21	65	March 1	91
Jan. 26	70		

Calculated per 10 days 19 per cent of the hemoglobin deficit and 6.2 units of hb were covered until Jan. 31st. This effect is slower than would be normally expected during iron treatment. But after all, he had attained a subnormal hemoglobin percentage on the first of March.

He was fit and well during the first 7 months of 1949 and gained weight.

During the autumn of 1949 he felt increasingly weak. He had continued his iron treatment until summer. Later on it was postponed, but he started on his own initiative a new course of treatment with iron from November, but without subjective improvement. In November he felt so weak that he could not keep himself afoot longer than for lunch time. He even got dyspeptic trouble again, with nausea and vomiting and lost some weight. When he was delivered into hospital his general status was not markedly different from what has been reported when he first entered. Blood examination the 14th of January 1950 showed: Hb 54 per cent. Red bl. corp. 1.92×10^6 per cu. mm. Colour index 1.4. Volume per erythrocyte: 110 cubicmicron. Leucocytes: 3,350. Sedimentation rate 38 mm.

Sternal marrow puncture: 31,200 cells per cu. mm. There was a distinct megaloblastic hyperplasia. Numerous thrombocytes were observed.

Gastric test meal: Positive Congo reaction. HCl/TA 14/39. Chemical examination of the stool for blood was negative on several occasions. X-ray of the gall bladder showed several calcium deposits in the region of the gall bladder and the right kidney. Even this time there was first started an iron treatment with 1.5 g reduced iron daily. There was no rise of hemoglobin, in fact a small decrease was observed. It was then decided to administer 10 mg folic acid 3 times daily from the 28th of February. The effect of the treatment is clearly illustrated in the following Table, No. 2.

TABLE II

Date	Hb	Reticulocytes	Medication
January 14	54 per cent		
January 18			Reduced iron 1.5 g.
January 24	54 per cent		
January 28	46 per cent		Folic acid 30 mg.
February 1		2.8 per cent	
February 2		8.4 per cent	
February 4	55 per cent	9. per cent	
February 6		11 per cent	
February 8		15.2 per cent	
February 10	53 per cent	10.2 per cent	
February 12		7.5 per cent	
February 15	73 per cent	5.2 per cent	
February 18		2.6 per cent	
February 20		1 per cent	
February 22	83 per cent		

By application of the same calculation as before, we find that 30 per cent of the hemoglobin deficit or 20 units of hemoglobin are covered per 10 days, a far better result than during iron treatment.

He gained weight from 65 to 69.7 kg and was discharged with a maintenance dosis of 10 mg folic acid and 1 g reduced iron daily.

COMMENTS

The patient in this case is a 65 year old male who during two stays, with an interval of one year, presented the typical picture of pernicious anaemia. In addition he had dyspeptic trouble for 30 years, resembling ulcer dyspepsia and had free HCl in his stomach.

During the first stay iron treatment was effective, but somewhat slow. During his next stay iron treatment was not effective. After treatment with folic acid, however, there was an optimal response with reticulocyte increase from the 5th day and a maximum increase on the 11th day.

The pathogenesis in this case is somewhat dubious. As stated earlier, it is a well known fact, that macrocytic anaemia, even typical pernicious anaemia, may appear in circumstances where the pathologic substrate seems to sit lower down than the stomach. The same anaemia as observed in intestinal stricture, may be encountered in diphyllobothrium latum infestation which is common in Finland. We shall discuss later if not even this condition might be pathogenetically of the

same origin as other intestinal diseases followed by pernicious anaemia.

Concerning the diseases in the ileum and jejunum with pernicious anaemia, sometimes cured after surgical intervention Faber put forward the opinion, that toxins from enteric stagnation were responsible. The same opinion has been defended by Meulengracht. R. Seyderhelm went so far as to postulate that all cases of pernicious anaemia were of this origin. He did even isolate from diphyllobothrium and from the stool of patients with pernicious anaemia some lipoid material. A water soluble fraction provoked hypervolume anaemia after injection into animals. In vitro it had a distinct haemolytic action. From these results he drew such therapeutic conclusion, that he treated 2 cases of pernicious anaemia by performing ileostomy with subsequent lavation of the colon. Both cases did respond favorably to this treatment, but relapsed after termination of the ileostomy 5 and 7 months later.

Since the contributions of Castle and Meulengracht, the interest has predominantly focussed on the stomach. It was further supposed that stricture anaemia was the consequence of defective absorption of the antipernicious principle. Barker & Hummel, however, made it clear, that the ability of absorption was not diminished in such cases. Neither was extrinsic factor lacking in the food, nor was there any disease of the liver which could explain the mechanism involved. They concluded therefore, that the liver principle did not act upon the bone marrow before it had neutralized such toxic products in the intestines as might act unfavorably upon the organism.

Meulengracht (1936) has stressed the common coincidence of anaemia and lack of HCl. In 25 personal and collected cases, there was lack of HCl in 18 cases. This fact according to our opinion makes it reasonable to suggest, that a certain number of cases may represent a coincidental fusion of two different conditions. The far more interesting finding of free HCl and Schlesinger's discovery of antipernicious factor in the stomach in such a case should make it reasonable to believe, that the absorption of antipernicious principle might be disturbed. As stated by Meulengracht it seems obvious that the condition of pernicious anaemia in enteric stricture depends upon the balance of two factors, one is the secretory activity in the stomach, the other the absorptive function of the intestine. Both factors, but probably chiefly the second, seem to be involved in the case reported here. On two occasions there was found free HCl in the stomach, whereas the x-ray examination of the digestive traci makes it probable that the absorption is impaired because of the intestinal diverticulosis.

The case reported here is interesting not only because it is the second case of this kind reported in the literature according to my knowledge, but also from other considerations.

First there is a slow, but satisfactory response to iron treatment during his first stay in hospital, notwithstanding a blood picture typical of pernicious anaemia. This may indicate that there is some correlation between the iron metabolism and the antipernicious principle. In this case there is first an iron deficit which is easily covered, whereas there is no response at all, one year later. Unfortunately technical circumstances did not allow us to make determinations of serum iron. But perhaps a relative defective absorption of the antipernicious principle might lead to such state of pernicious anaemia, as will respond to iron treatment. Or it might be supposed, that iron, at an early stage of pernicious anaemia can have some connection with the absorption or formation of the antipernicious principle.

Secondly this case demonstrates the effectiveness of folic acid even in this type of pernicious anaemia. It is hardly possible to explain this fully today. But it seems likely, that the theory of enteric toxins may be dropped. Even in diphyllobothrium latum infestation v. Bonsdorff has clearly demonstrated, that neither the worm itself has an anaemic effect, nor does it, mixed with dried hog stomach, reduce the antianaemic effect of the latter. Further v. Bonsdorff has shown that pernicious anaemia in this type of infestation only appears in those conditions where the worm lives in the upper part of the jejunum and not more distally. This fact demonstrates clearly, that the topographical localization seems to be more important than the chemical relations due to the worm itself. The correctness of this view is strongly supported by the latest achievement of v. Bonsdorff. Dried powdered diphyllobothrium administered orally in quantities from 5 to 10 gm. to patients with worm infestation showed a full correction of anaemia. A similar response was obtained in pernicious anaemia when gastric juice from a healthy subject was given simultaneously. It could be demonstrated that the effect was due to a high concentration of vit. B_{12} in the worm itself. B_{12} seems to be absorbed in great quantities from the intestines in the worm carrier.

It seems reasonable to suggest that pernicious anaemia in intestinal stricture, in multiple diverticulosis and in diphyllobothrium infestation is of identical pathogenesis. The condition seems to result not from a defective secretory activity in the stomach, but from defective elimination or absorption of the antipernicious principle. The latter is produced in considerable quantity, not only in the upper part of the digestive tract, but in the whole length of the intestines down to the ileocoecal valve. This explains the good therapeutic response obtained with liver or stomach extracts orally, if given in such amounts that sufficient quantities are absorbed. If this effect is missed, the administration must be changed to the parenteral route. Both the surgical effect in certain cases and the result of anthelmintic treatment are also fully explained. In non effective treatment by these procedures and lack of HCl in the stomach, a coincidental appearance of pernicious anaemia and the above mentioned intestinal diseases may be the explanation.

SUMMARY

1) In very rare cases of multiple intestinal diverticulosis, pernicious anaemia with intact HCl secretion into the stomach may be found.

2) A case is described in whom full correction of the hemoglobin deficit was obtained by iron treatment

notwithstanding a blood picture typical of pernicious anaemia. A relapse 1 year later did not respond to iron treatment, whereas treatment by folic acid was successful.

3) In non coincidental multiple intestinal diverticulosis and pernicious anaemia, either a defective elimination of antipernicious substance or more probably a defective absorption of this substance may be pathogenetically important.

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THE ANALYSIS OF DIETETIC TREATMENT OF CONSTIPATION

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THE DIETETIC therapy of constipation as used by the lay public as well as advised by most physicians is based on every day experience. Grandmother's health rules are good in general, but they can be improved by scientific criticism. It is believed that foods promoting bowel movement work mechanically on the lower intestines by bulky remnants of digestion. The mechanical stimulation of the colon by undigested residues of the food is thought to be the main force moving the bowels. The diet promoting bowel movement is called high residue or bulk diet. But certain facts point to chemical stimuli in the food playing a part in the propulsion of the feces. We know that some foods move the bowels although they are not bulky at all. For example, milk processed by fermentation, or fruit juices often work as laxatives. We know a pathological condition called fermentation dyspepsia associated with diarrhea which is caused by fermentation of starches and sugars. These and other experiences prove that chemical stimuli contribute to the movement of the colon and to provoking the defecation reflex. It is the importance of these chemical agents which suggested the following discussion in order to rationalize the diet therapy of constipation.

What do we know about chemical stimuli of bowel movement contained in the food? They are produced by bacterial growth in the undigested and unabsorbed food residues. We differentiate between two kinds of bacterial decomposition: fermentation and putrefaction. Fermentation means the decomposition of carbohydrates. Organic acids are the main products of fermentation in the bowels besides gases. Putrefaction in the bowels is bacterial decomposition of proteins. Substances such as amines, ammonia are the products. Fermentation acids suppress the growth of putrefacting bacteria. If carbohydrates are present in a food medium, fermentation bacteria outgrow putrefacting germs which have only a chance to develop after the fermentation of carbohydrates has been completed.

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Normally there is fermentation in the ileum and cecum. The carbohydrates have been used up, the fermentation acids absorbed in the ascending colon and putrefaction sets in. The contents meanwhile advanced to the transverse and descending colon, the feces go dry by absorption of water and bacterial growth stops.

The products of bacterial growth are the mentioned stimuli of bowel movement. Experiments of Magnus (1) and collaborators have shown that organic acids stimulate the movement of the small intestines and the large intestines as well. Le Heux found acetic acid more effective than any other acid. According to the theory of Magnus and Le Heux (2) choline supplied by the organism is the hormone moving the intestines, and organic acids combine with choline in the intestinal wall to form esters multiplying its efficiency. Acetylcholine is the strongest stimulant. Experiments of Mulinos (3), and Carlson, Smith and Gibbins (4) contradict the theory that choline is the mover of the intestines. But the moving power of organic acids has been confirmed by Gray (5), and Babkin (6) emphasizes their importance. Gray found that the moving power of the acid does not depend on its pH but is a specific function of the particular substance. Hydrochloric acid does not work at all. These experiments explain the clinical experience mentioned above about the laxative action of fermenting carbohydrates. They show that the active agents are the organic acids produced by fermentation.

The purgative action of many foods can be understood by this conception. They contain carbohydrates protected from being completely digested and absorbed in the small intestines by a cover of cellulose. The carbohydrate passing to the large intestines feeds fermentating bacteria which develop in the ileum and grow on the way through the proximal colon, producing fermentation acids. Another means of passing carbohydrates unabsorbed through the small intestines is ingesting sugar in the empty stomach. The sugar solution is propelled rapidly into the small intestines

and escapes partially digestion and absorption. The sugar carries its dissolvent water into the colon and feeds fermentating bacteria there. The dissolvent water and the fermentation acids both stimulate moving of the bowels. Lactose acts better than any other sugar as a physic. It has to be split by lactase to be absorbed and the bowels of adults produce little of this ferment, so that a large part of ingested lactose passes to the colon.

Products of putrefaction move the bowels also. Normally few remnants of protein food get into the colon and therefore not much putrefaction develops. Remnants of cellulose in roughage foods stimulate secretion in the colon and increase in this way the protein in the contents. But even then putrefaction is limited by the overgrowth of fermentating bacteria. In case of an inflammation of the mucous membrane of the colon there is a continual exudation, therefore an excessive growth of putrefaction bacteria at times, when no food remnants are present in the colon. When food gets in, fermentation acids are neutralized by alkaline substances formed by putrefaction, fermentation bacteria are overwhelmed by the predominance of putrefactors and continuous putrefaction prevails. Remnants of cellulose stimulate the exudation and increase the putrefaction. In such cases putrefaction diarrheas occur and food high in cellulose worsens the diarrhea or provokes it. This explains why roughage foods, such as abundant green vegetables, do not help much in alleviating constipation but cause diarrhea in colitis. Nothing is known about what particular substances produced by putrefaction stimulate bowel movement.

Let us now examine which part is played by mechanical and which by chemical forces in moving bowels by the residues of bulk foods. Leafy vegetables are supposed to act by mechanical impulses on the colon and defecation reflex. But their cellulose encloses a small quantity of fermentable carbohydrates which are not absorbed by the small intestines and feed fermentation bacteria in the colon. Furthermore, the hemicellulose of vegetables increases the bulk by water retention and makes the feces more slippery. The cellulose of fruit acts as bulky residue mechanically on the colon but, besides, it prevents sugar and organic fruit acids from being completely absorbed in the small intestines. Whole wheat bread, rye bread, cereals containing bran act mechanically by cellulose remnants and chemically by fermentation of starch protected by cellulose. The same is the case with peas, beans and lentils. The question arises which factor prevails in moving the bowels, the chemical or the mechanical. This problem may be answered by examining the influence of inert, indigestible and insoluble substances on the colon. Barium sulfate as used for x-ray examination is such a substance. It is well known that it hardly ever promotes the bowel movement by increasing the bulk of the fecal material, but, on the contrary, it slows down the bowel movement in many cases by hardening of the feces. Sometimes it even obstructs the pelvic colon by stone-like hard balls which have to be extracted. The same happens with sawdust mixed with the food as a bulk-creating substance (Salomon) (7). Hydrophilic bulk-producing agents, such as psyllium seed, karaya gum and their derivatives, have a certain laxative effect by water retention which keeps the feces soft and slippery. The same is true about mineral oil. But severer constipation does not yield to those measures. Significantly, certain bulk-producing insoluble substances have been used as obstipantia in diarrheas, for example charcoal. Our review proves that bowel moving foodstuffs work chiefly by chemical stimuli. From this point of view high residue or bulk diet is a misnomer for a diet combatting constipation. It should rather be named fermentation diet, because fermentation of the residue of the food in the colon is the working agent.

After this discussion let us examine which particular foods cause most fermentation and are therefore best to promote bowel movement. A powerful effect can be expected from cracked wheat bread. According to v. Noorden and Salomon (7) and Porges (9), it works much better than any other kind of whole grain bread. The particles of the size of millet expose a relatively small surface to the digestive ferments, and cellulose hinders the penetration of digestive juices. Unfortunately most brands of cracked wheat bread contain only very few grain particles mixed with flour. A much larger proportion of grain particles in this bread must be demanded to combat constipation. Most kinds of whole wheat bread are made from flour ground to a fine powder without removing the cellulose particles. Starch is separated from the cellulose, so that only a very small amount of it is protected from being digested and absorbed. Pumpernickel and rye bread combat even less constipation. Of course, the efficacy of all these breads depends on the quantity taken. One slice of cracked wheat bread a day works less than a pound of pumpernickel a day. But equal quantities taken, cracked wheat bread exceeds by far in laxative power any other kind of bread. Leguminosa, such as peas, beans and lentils, are good purgatives through ample starch enclosed in cellulose. Their skins do not contribute to their laxative power, proving that they act rather by chemical than by mechanical stimulation (v. Noorden) (8). Whole grain cereals are not very effective as laxatives because of almost complete separation of the starch from the cellulose. The same is the case about fine milled bran which has been advised as a laxative mixed with foods. Coarse bran works well. Fruits retain some sugar and organic acids in their passage through the small intestines, loosening bowel movement by supplying acids directly, and indirectly by fermentation of sugar. Fruit taken after meals does not work much, because mixed with the other food inside the stomach very little of fruit in the mixture at one time is passed through the intestines, and sugar and acids are easily digested and absorbed. But, if taken on an empty stomach, each portion passed through the intestines consists of fruit and a part escapes digestion and absorption. It is well known that fruit and fruit juices have to be taken before meals in order to promote bowel movement. A very effective laxative is dry fruit soaked in water at room temperature for some hours and taken with the water before meals. On the surface of dry fruit are fermentation bacteria which grow moderately in the water at room temperature without using up the fruit sugar. After ingestion the sugar solution enriched with fermentation bacteria passes quickly through the stomach, at body temperature growth of bacteria and

fermentation set in vigorously, the passage through the small intestines is accelerated, the colon is stimulated by the fermentation acids. Boiling or scalding of the dry fruit would destroy the fermentation bacteria and impair the efficacy. The action of fruit juices, sugar solutions, lactose taken before meals has been discussed above. Vegetables work by means of fermentable carbohydrates enclosed in cellulose as mentioned before. Raw vegetables act better, because cooking softens the covering cellulose and promotes the digestion and absorption of the enclosed carbohydrate. Milk has a laxative power through its lactose content. Moderate quantities of milk are not effective. Four or five quarts of milk per day move the bowels even in cases of stubborn constipation. The same can be done with buttermilk (sour milk). Smaller quantities of buttermilk may work taken with sugar on the empty stomach. Buttermilk abounds in fermentation bacteria. Sugar added propagates further bacterial growth and fermentation after passing into the intestines. The colon is reached by a vigorously fermenting acid solution which acts as a laxative.

Finally a few remarks about the practical application of these findings. Our scientific analysis showed that contrary to the general belief the main stimulus of bowel movement in foods is not their bulk but fermentation of carbohydrates which escaped the digestion. This knowledge may guide us in selecting foodstuffs more effective in combatting constipation. We cannot expect much success by a high vegetable diet as often suggested even by physicians. We have to choose foods which produce more fermentation. Experience shows the physician how to apply a diet without inconveniencing the patient. It would exceed the purpose of this discussion to describe the dietetic treatment of constipation exhaustively. General suggestions can only be given which have to be adjusted individually. Cases of slight constipation are easy to manage. Grandmother's rules cure the trouble. A glass of prune juice some time before breakfast and, if necessary, before dinner, may suffice. Other measures are the taking of more fruit or rye bread or more vegetables. Some patients know that eating fruit before retiring at night helps. A problem for the physician is the case of the severer chronic constipation in patients who have used laxative drugs for years. For such cases we have to select foods which supply the maximum of fermentation. 200 to 300 grams of cracked wheat bread per day is one of the measures suggested. In addition, the patient should take a tablespoonful of lactose in a glass of prune juice half an hour before breakfast. Another powerful laxative is dried fruit, as mentioned above. Five to ten prunes, figs or dates may be taken two or three hours after breakfast and/or three to four hours after lunch. If necessary, a glass (200 to 300 c.c.) of half buttermilk and half sweet fruit juice may be given at bedtime. The patient otherwise may eat normally after taking the mentioned loosening foods first.

Another regimen effective in cases of stubborn constipation is a diet of four quarts of milk and one-half pound of cracked wheat bread a day. A combination of this and the former diet is possible but milk only works if given in quantities. Other kinds of loosening foods, such as peas, beans and lentils or raw vegetables, can be given in addition or as a change replacing other kinds of laxative foods. Grapes work well against constipation if taken in quantities of at least 10 pounds a day. They should be eaten with the skins as the latter carry acid into the colon. Combining these dietetic measures with lubricating drugs is possible.

In cases of constipation complicated with disease of the stomach, the small intestines, the colon or the gallbladder, the diet has to be modified. Roughage has to be often restricted and fruit juices, lactose, milk in quantities may help. Cases of so-called spastic constipation on the contrary do not require another diet than cases of "atonic" constipation (v. Noorden (8), Porges (9)). The spasms are not the cause but the result of long lasting constipation, a reaction to injury in the distal colon by hard dry feces. A bland diet would cause further thickening of the fecal material higher up and impair the passage through the injured segments of the distal colon. A high fermentation diet loosens the feces which then pass easily through the spastic segments. Intestinal obstruction of course should not be attempted to be treated with diet; it requires surgery.

SUMMARY

1. The dietetic treatment of constipation works mainly by chemical stimuli of bowel movement in the residue of food.

2. The chemical stimuli are organic acids produced out of carbohydrates by fermentating bacteria in the colon.

3. Foods loosening bowel movement contain carbohydrates protected by cellulose from being absorbed in the small intestines or sugars given in such a way that they escape partially absorption in the small intestines.

4. A diet combating constipation should be better named high fermentation diet than high residue or bulk diet.

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THE DIETARY TREATMENT OF DIARRHEAL DISEASES

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DIARRHEA IS probably responsible for more nutritional deficiencies than any other symptom, or group of symptoms. In like manner, starvation diets or inadequate diets cause more therapeutic failures in the management of diarrheal disorders than any unwise choice of drug or combination of drugs. The physician must recognize that a diet skillfully constructed and managed constitutes specific therapy in these cases. A diarrhea must be considered a nutritional emergency and as such it merits immediate dietary attention. Starvation diets, bland, light or soft diets are not only inadequate but are confusing to patients and often delay convalescence.

The patient suffering with diarrhea which is of sufficient severity to require medical care must be given a specific diet with detailed instructions as to the selection and preparation of foods and time and regularity of meals. The introduction of new food habits takes much of the physician's time but pays valuable dividends. The diet should be high in proteins, rich in vitamins, low in residue and optimum in caloric value. The following diet has satisfied the test of time and long experience (1).

8:00 A. M. *Breakfast*
- Orange juice
- Cereal
- 1 or 2 eggs
- Two slices white toast with butter
- Half glass evaporated milk with half glass sweetened tea or postum

12:30 P. M. *Lunch*
- Tomato juice or grapefruit juice
- Meat or Fish
- 2 well cooked vegetables
- Dessert
- Half glass evaporated milk with half glass sweetened tea or postum

6:00 P. M. *Supper*
- Tomato juice or grapefruit juice
- Meat or Fish
- Two well cooked vegetables
- Two slices white toast with butter
- Dessert
- Half glass evaporated milk with half glass sweetened tea or postum

In-Between Meals 10:00 A. M. - 3:00 P. M. - 9:00 P. M.
- Bananas, hard boiled eggs, cream cheese, grilled American cheese on toast, salted crackers, evaporated milk as above

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One may note that the foods listed are easily absorbable, non-stimulating to peristalsis, readily obtainable and easily prepared by the patient. Each patient is urged to adhere strictly to this diet and avoid all spices and foods not listed. Fried foods are difficult to digest and not allowed. Any food to which the patient has shown definite sensitivity must be excluded. The dietary history will aid the physician in this respect. If information was obtained that eggs were never tolerated, they are to be omitted especially at the beginning of treatment. Meats must be well cooked. Rare or incompletely cooked foods are difficult to digest. Patients must be told that canned vegetables and fruits are just as nutritious and wholesome as the fresh variety. Some canned vegetables and fruits are of superlative quality. Their choice eliminates chores which are time consuming and exhausting for patients and their families. The time saved can be used to greater advantage for essential "rest periods."

There are other misconceptions pertaining to foods in diarrheal disorders prevalent amongst patients and physicians alike. The belief that fruit juices are laxative is only a half truth. It depends entirely upon the quantity and type of fruit juice consumed. Four to six ounces of orange, grapefruit or tomato juice at the beginning of each basic meal have not stimulated bowel evacuations especially when the juices are at room temperature and sipped slowly. The belief that raw foods such as vegetables, fruits and even meats are more nutritious and more beneficial is prevalent in the medical profession even today. This does not coincide with the experience of daily practice. Raw foods are bulky, overdistend the stomach and are difficult to digest. They are irritating to the inflamed and edematous mucosa. They increase peristalsis and therefore are ultimately less beneficial to the patient. Each of the above basic meals is reinforced with one of the multi-vitamin capsules readily obtainable on the market. Water up to six and eight glasses per day sipped slowly is an important replacement and aids in digestion. All foods are salted to taste. The use of lemon juice on fish or in tomato juice is encouraged. As the condition improves non-strained vegetables are allowed and single additions to the diet are made cautiously. It is extremely important to weigh the patient each day or at every visit to the office. This will approximate the nutritional state of the patient without involving time consuming physical examinations and blood analyses.

Cereals	*Meats*	*Vegetables*	*Desserts*
Farina	Beef	Carrots	Cooked or canned pears
Cream of wheat	Lamb chops	Peas—strained	Apricots
Puffed rice	Steaks	Beets	Peaches
Cornflakes	Liver	String beans, strained	Baked Apple
Oatmeal, strained	Chicken or Fish	Rice, well cooked	Applesauce
Rice Krispies		Asparagus tips	Rice Pudding
Cream of Rice		Potato or Spaghetti	Fruit Jello
			Cookies, plain
			Plain cake, toasted

Numerous questions are asked by patients regarding cake, candy, chocolate, gum, tobacco, alcoholic beverages, soups and fresh milk. Physiologic studies have shown that tobacco stimulates peristalsis and frequently diminishes the appetite. Nicotine constricts terminal blood vessels and therefore interferes with the intramural circulation or vascular supply of the intestinal tract. Cake, candy, chocolate and gum lead to distention and a feeling of fullness. Alcoholic beverages increase peristalsis and interfere with dietary discipline. Soups satisfy the appetite, limit the intake of solid foods but have very little caloric value. They are also gas producing. Evaporated milk is preferred to other types of milk because of its hypoallergenic properties, its sterility and low curd tension which favors digestion.

The author has long discontinued the use of kaolin and kaolin mixtures in chronic diarrheal disorders. They absorb vital gastric juice and inhibit the appetite. They impede the absorption of essential nutrient elements especially vitamins. More emphasis is placed on foods rather than drug mixtures because these patients do not tolerate well oral medication.

Various food products have been favorably reported in the dietetic management of diarrheas in infants and children. Dehydrated banana (2), raw apple (3) and dried tomato pulp (4) have been amongst those investigated. In 1941 a Spanish physician, R. Ramos, discovered the therapeutic value of the carob bean. During the Spanish Civil War he observed that the children of the poorer classes who ate large quantities of carob beans had less diarrheal disorders than the children of the wealthy. After considerable clinical investigation he and Rozalen (5) reported the prophylactic and therapeutic efficacy of the dried pulp of the carob bean. In 1946 Neyroud (6) and his colleagues in Bern reported considerable success in the treatment of infantile diarrhea by the addition of carob flour to the infant diet. The value of this chocolate-like powder has been further substantiated in this country by Smith and Fischer (7), Kaliski and Mitchell (8), Plowright (9), and Abella (10). The latter obtained significant supportive data by comparing results in 300 cases of acute diarrhea treated with carob flour (Arobon) and 300 cases treated without carob flour. The period of hospitalization and the duration of the diarrhea were shortened to almost one-half the time of the control group.

These encouraging reports stimulated the author's interest in carob flour and the determination of its value in adult patients suffering with chronic diarrhea. The product* was supplied in the form of a powder, chocolate-like in color and flavor, pleasantly sweet and palatable. The following table shows the composition of carob flour as represented by the product Arobon:

*Carob flour (Arobon) was kindly supplied by The Nestlé Co., Inc.

Fat (ether extract)		0.5 per cent
Protein (N x 5.7)		3.5
Soluble carbohydrates (sucrose & reducing sugars)		49.0
Other carbohydrates (lignin, hemicellulose & pect'n)		22.0
Starch		13.0
Crude fiber		6.0
Minerals (ash)		2.5
Moisture		3.5
Calories	270 per 100 Gm.	
1 oz. by dry weight equals	77 calories	
1 tablespoonful	21 calories	

The high lignin and pectin content of carob flour is said to favor its properties of absorption and detoxification (6, 11). Tolerance and digestibility are assured by the low fat content and the high percentage of soluble and simple carbohydrates.

During the past nine months carob flour was added to the diet of over fifty adult patients varying in age from 24 to 76 years suffering with various types of diarrheal disorders. These included cases of permanent ileostomy, colostomy, colitis, ileocolitis, amebic colitis, giardiasis and regional enteritis. The clinical results indicate that carob flour is a valuable adjunct in the dietary treatment. No patient was encountered who was sensitive to this food. It was taken in plain or carbonated water, two tablespoonfuls to the glass three or four times daily between meals. To facilitate its use by ambulatory patients special wafers of carob flour were prepared and tried with very satisfactory results. Each wafer was equivalent to a tablespoonful of the powder. The striking clinical effects were diminution in the number and fluidity of the stools. These results were usually apparent within 48 to 72 hours.

The addition of carob flour to the diet does not impair the absorption of antibiotics. Three patients were given chloromycetin, terramycin and aureomycin respectively for 24 hours in doses of 250 mg. every 4 hours, and their sera were analyzed for the particular antibiotic given. Then one to two tablespoonfuls of carob flour in a glass of water, or one to two wafers were given every four hours. After 24 hours the serum was again analyzed for its antibiotic content. The following table shows a marked rise in the levels of the drug after ingestion of the product. This rise does not necessarily mean that the carob flour enhanced the absorption of the antibiotics; it rather shows no interference with the cumulative effect of the antibiotics in the blood stream after 48 hours of drug administration. The cumulative effect of antibiotics is well known in clinical practice.

CONCLUSION

The dietary management of diarrheal diseases must be based on experience with palatable foods well cooked and rich in proteins, rich in vitamins and min-

EFFECT OF CAROB FLOUR (AROBON) UPON ABSORPTION OF ANTIBIOTICS

Antibiotic	*Serum Before Ingestion of Carob Flour (Arobon)*	*Serum 24 Hrs. After Ingestion of Carob Flour (Arobon)*
Chloromycetin	0.024 meg/ml	0.032 meg/ml
Terramycin	0.036 meg/ml	0.048 meg/ml
Aureomycin	0.048 meg/ml	0.095 meg/ml

erals, high in caloric value, low in residue, low in fats, and hypoallergenic in its properties. Detailed instructions regarding time and regularity of meals are extremely important. New foods must be added cautiously and their tolerance carefully determined. The addition of carob flour to the diet encourages the intake of water and aids in the diminution of the number and fluidity of the stools.

SUMMARY

A specific diet which has stood the test of time in the treatment of Diarrheal Diseases is given in detail with a full discussion of some of the underlying principles involved. Common misconceptions, pertaining to foods, prevalent amongst patients and physicians are discussed. Practical considerations are emphasized. Carob flour (Arobon), a hygroscopic fruit powder extensively used in the acute diarrheal diseases of infants and children in this country and abroad has been tried with gratifying results in the chronic diarrheas of adults exclusive of etiology. The oral use of carob flour does not impair the absorption of chloromycetin, terramycin, or aureomycin.

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PERFORATION OF ESOPHAGEAL ULCER THREE YEARS AFTER TOTAL GASTRECTOMY: A CASE REPORT

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IN THE past ten years total gastrectomy has become a relatively common procedure. Because of refinements in surgical technic, our newly utilized knowledge of fluid and electrolyte balance and the extensive use of antibiotics, this operation can now be performed with a mortality rate under 10%. For this reason, total gastrectomies are being performed daily throughout the country. It is only inevitable that complications or post operative sequelae that had not been thought of would appear. One such sequela is the development of an ulcerative process in the lower end of the esophagus with perforation.

In the performance of this total gastrectomy the lower portion of the esophagus was made intra-abdominal in position and then anastomosed to the jejunum. Since the portion of the esophagus involved in the ulcerative process is now abdominal instead of thoracic, peritonitis and not mediastinitis resulted when the esophageal ulcer perforated. Under these circumstances, the treatment should be much the same as for perforated gastric ulcer. In this specific case because twenty-four hours had elapsed between perforation and hospitalization conservative management with intubation of the small bowel and tube feeding was instituted. Recovery was uneventful.

From Grace Hospital, Detroit.

Submitted Dec. 24, 1952.

CASE REPORT

F. K., a 52 year old white woman, was admitted to Grace Hospital August 7, 1952 complaining of severe epigastric pain. She had noted the onset of pain in the epigastrium two months ago. This pain was not severe and was intermittent in character. She did not vomit and was considerably relieved by taking banthine. She was awakened at 2:00 a.m. the day before admission to the hospital by an excrutiating pain in the epigastrium. She vomited and became cold and clammy. A profuse cold sweat was associated with the onset of this severe pain. She was treated by a physician by injections of morphine for the next eighteen hours. The pain became so severe despite the morphine that the patient consented to hospitalization.

She had been operated upon three years previously by Dr. Alexander Brunschwig for carcinoma of the posterior wall of the stomach with direct extension into the neck of the pancreas. At that time, a total gastrectomy and subtotal pancreatectomy, cholecystectomy and splenectomy was done. Upon returning to Detroit following her surgery in New York, she developed a draining sinus which was shown to be due to a pancreatic fistula. This was treated by roentgen therapy. Following this the drainage ceased. She carried on quite well after this. She would eat five to six small meals a day taking pancreatin three times a day with dilute hydrochloric acid and iron in tablet

form. On this regime her red blood count had maintained itself rather well. She had been able to do her own work although she had not regained her preoperative weight. Laboratory studies following her surgery: 4-6-50—r.b.c. 4,540,000 Hbb. 85%. Fasting blood sugar—104 mmg. 10-5-50—r.b.c. 3,510,000 Hbb. 75%. 1-21-52—r.b.c.—3,610,000 Hbb. 72%.

Upon examination in the hospital she was found to be a pale, listless, white woman appearing much older than her stated age. She was acutely ill. Pain was severe enough to cause patient to moan continuously. She was quite emaciated and her lips were dry. Examination of her head, eyes, ears and nose showed no pathology. Her oral mucous membranes and tongue were dry. Heart: not enlarged to percussion. Rate and rhythm normal. No murmurs. B. P. 100/70. Lungs: tactile fremitus normal. No rales. Voice and breath sounds normal. Resonant to percussion. Abdomen: Moderately distended. A left paramedian scar which was well healed was noted. A McBurney scar was also present. Abdomen markedly tender especially in the epigastric and lower right quadrants.

Temperature 101, pulse 120, respirations 22.

Laboratory: R.B.C. 2,670,000 Hbb. 69%, W.B.C. 16,000, Polys. 88%, Filaments 80%, Non filament 20%, Lymphs. 12%, Urine: neg.

She improved considerably under suction through a Cantor tube and intravenous alimentation. Massive doses of penicillin and intravenous aureomycin were given during this time and in addition 1500 c.c. of whole blood.

Because of this improvement, the Cantor tube was removed and a small amount of dilute barium was given and radiographic studies to permit an exact diagnosis were undertaken. Figure No. 1 demonstrates a perforation in an ulcerative process above the dilated lower end of the esophagus with a contraction of the anastomosis between esophagus and jejunum.

The Cantor tube was re-inserted and after all the barium was aspirated tube feeding was instituted. Her recovery was uneventful. She was discharged on August 25, 1952.

Fig. 1: Note dilatation of lower end of intra-abdominal esophagus. Anastomotic site appears contracted although barium passes readily into jejunum. Note perforation above the dilated esophagus several inches above the anastomosis.

SUMMARY

This patient in whom a total gastrectomy and subtotal pancreatectomy had been performed remained well for three years. She then developed an ulceration in the lower end of the esophagus which was now intra-abdominal in position. The ulceration perforated producing a peritonitis. She was treated as one would a late perforated gastric ulcer. Recovery was uneventful.

It is of interest to note that her blood sugar level remained normal despite the extensive extirpation of pancreatic tissue both at the time of surgery and later by roentgen therapy.

ABSTRACTS ON NUTRITION

BIGGS, M. W. AND COLEMAN, D.: *A quantitative metabolic defect in lipid metabolism associated with abnormal serum lipoproteins in man.* Circulation, VII, 3, Mar. 1953, 393-402.

Tritium-labeled cholesterol was fed to a selected series of patients to demonstrate a quantitative metabolic defect in lipid metabolism in the presence of abnormal serum lipoprotein spectra. Patients with abnormal serum lipoprotein spectra carry a greater fraction of their newly absorbed cholesterol in the esterified form than do normals.

LUNTZ, G. R. W. N. AND SMITH, S. G.: *Effect of isoniazid on carbohydrate metabolism in controls and diabetics.* Brit. Med. J., Feb. 7, 1953, 296-299.

The authors have shown that after isoniazid, the oral glucose-tolerance test shows raised blood sugar levels in both diabetic and non-diabetic tuberculous patients and that the insulin requirements of diabetic patients receiving isoniazid may be increased.

LAWRENCE, R. D. AND OAKLEY, W.: *A new long-*

acting insulin. Brit. Med. J., Jan. 31, 1953, 242-244.

A new insulin made by certain Danish chemists appears to exert a prolonged hypoglycemic action, lasting at least 24 hours, which is strong enough to control the blood sugar of moderately severe diabetics throughout the day without causing nocturnal hypoglycemia. It is known as "lente insulin" and is made by using an acetate buffer. It cannot be mixed with other insulins.

JOYNER, C. R.: *Essential hyperlipemia.* Ann. Int. Med., 38, 4, April 1953, 759-777.

Essential or idiopathic hyperlipemia is a rare condition in which the only abnormality is a persistent exaggeration of the physiologic hyperlipemia of fat ingestion. The author adds another new case to the 22 cases already described. The disease may be associated with xanthomata, abdominal pain, lipemia retinitis, and enlargement of spleen and liver. It responds well to a diet low in fat and cholesterol. The diagnosis may be suspected by finding a lactescent serum in the hematocrit.

FABRYKANT, M.: *Further studies on electrocerebral dysfunction and the use of anti-convulsants in labile diabetes.* Ann. Int. Med., 38, 4, April 1953, 814-823.

Electroencephalographic abnormalities were recorded in 80 percent of 15 labile diabetics. Such abnormalities were considered due to repeated, severe, insulin reactions. The use of various anti-convulsants (dilantin, mesantoin produced excellent results in the majority of cases. It is believed, however, that such cerebral dysfunction is the only cause of lability in diabetes.

BEAUDVIN, R., VAN ITALLIC, T. B. AND MAYER, J.: *Carbohydrate metabolism in "active" and "static" human obesity.* J. Clin. Nutrition, 1, 2, Jan. 1953, 91-99.

Static obesity is the condition where the individual has gained excess weight but gains no further weight. Active obesity describes the condition while the individual is in the process of gaining weight. It was found that obese subjects in the active phase of obesity displayed a markedly increased tolerance to carbohydrate after ingestion of self-selected meals and also after test doses of dextrose. The importance of distinguishing between the active and static phases of obesity in the interpretation of metabolic data is stressed. The phenomenon described may be due to decreased lipolysis, or it may be due to hyperinsulinism, or even both.

CASS, L. J., FREDERIK, W. S. AND DI GREGORIO, S.: *A controlled clinical evaluation of two hematinic agents.* Journal-Lancet, Feb. 1953, 51-79.

A comparison of hemoglobin formation in anemia as promoted by ferrous sulfate, on the one hand, and a new iron compound, iron sodium malate (Reed and Carnick) on the other, indicated the superiority of the latter in all ages. However, it should be noted that the iron sodium malate contained some copper, desiccated liver, thiamin, vitamin D and vitamin B_{12}, whereas the ferrous sulfate apparently did not. (It has been known for some time that iron given in conjunction with vitamins produces more rapid recovery from iron deficiency anemia than does iron alone—Reviewer).

TUTTLE, ESTHER: *Dietary Cholesterol and Atherosclerosis.* Geriatrics. 7, 1, 37. Jan. 1952.

Insofar as hypercholesterolemia is incident to, or causative of, atherosclerosis accompanying coronary sclerosis, its control requires: 1) a proper dietary approach. Some cholesterol is synthesized in the body. The deprivation of certain fats and other high cholesterol foods is required in a therapeutic diet to lower the blood cholesterol. Exclusion of animal sources of cholesterol and of non-physiological fats, like hydrogenated fats, diminish the blood cholesterol levels.

2) Oxidation is involved in cholesterol metabolism according to Tuttle, so that drugs like thyroid administered to accelerate aerobic, and particularly anaerobic oxidation, are usually required.

3) Proper vitamin B formulations are necessary to stimulate enzymatic activity.

4) An outside source of unsaturated fat acids, especially those derived from sunflower seed lecithin or even sunflower seed oil, relieve the liver of desaturation burden and help in the utilization of free cholesterol.

Franz J. Lust.

WADHAM, S. M.: *The world food problem—technical or social?* Med. J. Australia, Feb. 14, 1953.

Wadham, Professor of Agriculture in the University of Melbourne, presents an extended and apparently sound appraisal of the world food problem. Essentially, he is less pessimistic than the majority of writers on this subject because, as he points out, very dismal predictions have been made in the past, by Malthus in 1789, by Sir William Crooks in 1898 who predicted world starvation by 1930; (and more recently by Bertrand Russell, who is not mentioned by the author). In the first two instances the predictions were false. At present increased production from land under cultivation can be expected through scientific farming. New areas may be opened up to agriculture in various parts of the world provided sufficient assistance is forthcoming. The artificial production of increased rainfall is in its infancy but may become important. Solar energy may be used for synthesizing carbohydrates. The protein synthesized by yeasts could easily be used, although the process still is expensive. Waldham has word that the authorities in India favor birth control, although he, of course, does not expand on the difficulties of inculcating such a system in India.

One of the most interesting phases of Wadham's article is his frequent reiteration of the thesis that the age of cheap food has passed. He believes that the price of food must be kept up, if necessary by means of government support, as in America, if the farmer is to be expected to do a thorough job.

TONGE, W. L.: *Nicotinic acid in the treatment of depression.* Ann. Int. Med., 3813, Mar. 1953, 551-553.

Early reports by Washborne indicated marked incidence of improvement in depression as a result of nicotinic acid treatment. Tonge's series of 16 cases received 450 to 600 mg. by mouth daily for the first week, then 900 mg. daily for two weeks, in divided doses. A

control series employing placebos were used. The encouraging results of a previous investigation were not confirmed. It is concluded that nicotinic acid is not a useful agent in the treatment of depression, although a mild depression in a young person may show some favorable response.

THOMPSON, G. C.: *Office management of diabetes.* Harper Hosp. Bull., II, 1. Jan.-Feb. 1953, 18-23.

Diabetes is one of the few chronic diseases in which the patient can remain economically and socially active. It is a "nuisance disease" and unnecessary inconveniences should not be imposed. The diet is the fixed factor, and all others are variable. Treatment of adiposity is important when present. The author makes the statement that protein does not increase insulin requirements. The use of the various insulins is described.

HALER, D.: *The therapeutic response of secondary anemias to organic and inorganic iron salts.* Brit. Med. J., Dec. 6, 1952, 1241-42.

The author found that ferrous gluconate produced a much more rapid recovery from secondary anemias than did the inorganic salt, ferrous sulphate. However, the organic preparation of ferrous gluconate contained also thiamine, nicotinamide, riboflavin and ascorbic acid. Yet the author does not particularly stress the possible influence that these vitamins may have exerted on the blood regeneration.

LATNER, A. L. AND UNGLEY, C. C.: *Electrophoresis of human gastric juice in relation to Castle's intrinsic factor.* Brit. Med. J., Feb. 28, 1953, 467-473.

Concentrated human gastric juice was subjected to preparative electrophoresis on filter paper. Several peaks were demonstrated by a protein-staining method. All had vitamin B_{12}-binding activity. Material from two of these peaks—one on the cathode side and one on the anode side of the starting point—was shown *clinically* to possess intrinsic-factor activity. Material corresponding to the anode peak, which appeared to be the more active of the two, has been shown to contain either a mucoprotein or a mucopolysaccharide.

EDITORIAL

ADIPOSITY

The usual term—obesity—is actually a misnomer as it comes from the Latin *obesus* meaning lean.* Hence, adiposity is a much better word. A definition of adiposity is: an excess of fat over the expected normal when age, height, and sex of the patient are considered. Thus the exogenous concept is commonly accepted with perhaps five percent endogenous from endocrine imbalance. At least a third of our population shows a ten percent or more increase over the predicted weight. When experience has shown that this predisposes to hypertension, cardiac disease, diabetes, cancer, nephritis, arthritis, it would seem incumbent on the physician to alleviate this state.

The level of satiation may vary with an individual possibly based on whether the main appepstat is cerebral or hypothalamic. Consistently in those people who are in the early stage of gaining weight there appears an increased tolerance to carbohydrate and later, on the adipose side, an impaired tolerance. Functional hyperinsulinism leading to increased lipogenesis is a convenient explanation of collected data. The psychosomaticist seems to be quite certain that a conflict can be found and that once it is adequately brought out the results are excellent. This marked increase in caloric intake would be based on a sense of insecurity, reward, fetish, or pleasure, and concomitant decreased activity.

One particular syndrome—Metabolic Craniopathy or Morgagni—Stewart-Morel Syndrome should fascinate the internist. Here the obesity, or better adiposity, is found predominantly in females of the fourth and fifth decades, with a rhizomelique distribution, i.e. symmetrical with proximal extremities more so involved. There is proliferation of the endosteum of the frontal bone i.e. hyperostosis frontalis interna and a greater incidence of psychoses with, uniformly, atrophy of the frontal lobes. The glucose tolerance curve shows impaired tolerance with oral and intravenous tests, but tests of thyroid function and adrenal are within a normal range, the latter on the low side, however. It is interesting to speculate that the deficiency is in the pyruvic acid oxidase or its inhibition, so that oxidation of fat is impaired and lipogenesis is stimulated. The phosphorus level when done simultaneously would appear to drop, as in a normal.

There is a certain amount of skepticism that psychoanalysis alone or in combination with diet is the entire answer. Consequently a *crutch* containing a sympathomimetic drug, sedative, calorigenic agent and a bulk or hydrophilic substance such as Raymer "Obethose" is utilized by most physicians. It should be noted that the drug is used only where the exogenous type exists and there are no contra-indications. Salt and water should be allowed in moderation as well as graded exercise.

In a preliminary study on twelve patients the results were excellent, all patients tolerated the drug well without side effects and the weight loss averaged three pounds per week. The drug was cut off gradually when near the ideal weight. A thousand calorie diet was prescribed and thoroughly gone into, but perhaps one out of three came close to following this diet. However, a regular diet and eating habit must be established to maintain the good result.

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*See American Lectures Series, Obesity monograph, page 3, 1949, Rynearson and Gastineau.

VANNEVAR BUSH'S TOWER OF BABEL

In the Medical Annals of the Medical Society of the District of Columbia, for January 1953, there appears an interesting address by Vannevar Bush, who states that science is "in danger of building a Tower of Babel." The publication of thousands of highly specialized journals, which naturally no one person can possibly read, is the result of the necessary present specialization in all fields. Today, no physician can maintain a complete view of medicine if, by this, we mean memory of the rapidly accumulating details in the various departments of medicine. A good example is to be found in the fact that an average physician could pick up a journal devoted to psychiatry and read it without having much idea what many of the scientific neologisms meant, or what the articles proved or disproved.

Bush correctly lays the blame for our present growing confusion upon the complexity of man himself, who is the subject of medical study. He offers two practical lines of attack upon the scientific situation. One is that writers should make themselves intelligible. The other is equally difficult and refers to a synthesis of present knowledge as it emerges. This might be accomplished by discovering a few physicians who possessed sufficient genius to gather together and digest this knowledge into a form acceptable to the average reader. Such synthesizers should be paid well for their work.

Bush mentions the astonishing complexity of organic and biological chemistry, involving vitamins, hormones, etc. He feels that a great deal must be done before there can emerge that integrated, *complete understanding* which alone can form a sound and adequate scientific base for the profession of medicine.

There are some philosophers, of course, who honestly believe that there is not now and never shall be any way of intellectually grasping *essence*. There are others who even do not believe we shall ever possess a complete understanding of the human body and mind. Nobody knows whether they are right or wrong. However, there still remains "the art of medicine." There are also multitudes of physicians whose intuitive grasp of human nature, combined with what we may term a reasonably good scientific training, render them extremely useful servants and teachers of the race, in spite of the admitted "confusion" to which Bush refers.

IS THE WORLD FOOD PICTURE AS DEPRESSING AS WE THOUGHT?

Everyone today is well-versed in the thesis that the rapid population increase in the world is bound to outstrip world food production, resulting in fairly widespread starvation at some date, however near or distant. Malthus in 1789 made a very similar and dreary prediction, but he was wrong because British land reform and improved agricultural methods came to the rescue of the English people. Sir William Crooks, stepping somewhat out of his field as a physicist, alarmed the world in 1898 on the same score and predicted general world starvation by the year 1930. Most recently, Bertrand Russell, whose logic most people respect, became greatly upset by the same specter of global malnutrition, and turned solely to a form of rather impossible birth control enforcement as a solution.

As we know, the United Nations organization and the Food and Agricultural organization have been working on this specific problem for half a decade, greatly assisted by the unselfish gifts of various United States organizations, including the Point Four program of President Truman. Nevertheless, there has been detectable in the writings of most technical authorities a very obvious pessimism with respect to the ultimate outcome of the contest between food production on the one hand and population increase on the other hand. The first note of undeniable optimism that the writer has encountered was an oration by S. M. Wadham, Professor of Agriculture in the University of Melbourne, and published in the Feb. 14, 1953 issue of the Medical Journal of Australia, entitled "The World Food Problem—Technical or Social?" Is the problem to be solved by scientific advancement in plant production, new methods of increasing acreage yields, opening up undeveloped land areas, etc., or does its solution require social reforms (among which, presumably, the acceptance of birth control would be but one)? No doubt Wadham believes both the scientific and social factors are important, but he begins by stating that all the findings of modern science have by no means been applied, as yet, to agricultural practice. At the present time the intelligent world has at least become *aware* of the peculiar problem—indeed the paradox—of "want in a world of plenty." Wadham is quite right, of course, in saying that "the introduction of charity into a wide-spread system which is economically balanced in respect to its dependent local market is not an easy matter." But the Food and Agriculture Organization has at least made it plain that, in addition to intensified agriculture, there is equal need for such things as erosion control, more irrigation, more rural education and, in some instances, reform in land tenures and credit systems. *The objectives cannot be attained in a short period of time.* There is a ray of hope from the alleged facts that families in India are becoming smaller and that the population of China has not been increasing for some time. Wadham refers to three scientific undertakings that hold special promise. One is the perfecting of the art of rain-making. Another is the possibility of using solar energy to synthesize carbohydrate. The third is the synthesis of proteins by various yeasts.

Wadham believes that the day of *cheap food* is past—or should be past. There must be a sufficient profit incentive for the farmer, even if the government, (as in the U. S. A.) has to support farm prices. This brings up the perennial problem of striking a balance between industry and agriculture, something which has apparently never been accomplished. It is good to find a person of Wadham's erudition presenting the more pleasant possibilities with respect to his title subject. Yet, on due consideration, one is inclined still to a certain degree of pessimism, inasmuch as many other authorities have pointed out that the very rapid increase in world population, particularly in regions where intelligence and adaptability are at a low ebb, threatens the world supply of food in a very drastic manner, unless some unforeseen acceleration of food production soon is forthcoming.

AMER. JOUR. DIG. DIS.

BOOK REVIEWS

OVEREATING, OVERWEIGHT AND OBESITY. Proceedings of the Nutrition Symposium held at the Harvard School of Public Health, Boston, Mass., Oct. 29, 1952. The National Vitamin Foundation, Inc., 150 Broadway, New York 38, N. Y. $1.50.

This book contains a liberal supply of factual data respecting obesity, appetite and related topics, some of which are comparatively new. It also contains some interesting polemics aroused by a paper by A. W. Pennington who presents a more-or-less sure-fire and simple method of weight reduction. His article should be read in its entirety for a good understanding of it, but essentially it means that protein and fat, with very little carbohydrate, will bring about weight reduction even at a fairly high caloric level of intake. Pennington's explanation is that restriction of carbohydrate removes the inhibiting effect of pyruvic acid on the utilization of fat. Hegsted, in discussing Pennington's paper, does not doubt the results that Pennington claims but he is not prepared to accept the explanation as being necessarily sound.

THE SURGERY OF PANCREATIC NEOPLASMS. Rodney Smith, M.S., F.R.C.S. The Williams and Wilkins Co., Baltimore, Md., 1953, $7.50.

A very concise, satisfactory and complete treatise on the title subject, well-illustrated, with due consideration to diagnosis, as well as surgical treatment in its various forms, won for the author the Jacksonian Prize in 1951, and should be in the possession of all surgeons and internists.

THE CONCEPTION OF DISEASE. Walther Riese, M.D. Philosophical Library, New York, $3.75.

This is a volume to delight the medical philosopher inasmuch as it describes, with admirable brevity, the various conceptions of disease which, historically, have held sway in the minds of men. Beginning with the stoics, who denied the existence of disease, the book brings us up through the Platonic, the Galenic and several other concepts to the present time. Considerable space is devoted to Rousseau, as well as to Freud. The author takes the attitude that "a view of mankind, not comprising disease and infirmity will always be an incomplete one." He feels that disease is a "natural" process. In other words, there is no such thing, in the past, present, or future, as Rousseau's perfectly healthy state.

SURGERY OF THE ESOPHAGUS. R. H. Franklin, M.B., B.S., F.R.C.S. The Williams and Wilkins Co., Baltimore, 1953, $8.50.

The senior surgeon of the Post-Graduate School of Medicine, London, England, has condensed into 250 pages all that needs to be known about the surgical conditions of the esophagus. It is of value both to the gastro-enterologist and those who aspire to do this difficult kind of surgery.

AMEBIASIS. Hamilton H. Anderson, M.D., Warren L. Bostick, M.D. and Herbert G. Johnston, Ph.D., Charles C. Thomas, Springfield, Illinois, 1953, $11.50.

This is a very exhaustive, technical and yet highly useful volume and appears to bring the treatment of amebiasis up to date. Every internist who sees amebiasis (or rather recognizes it) should buy the book, as he will not need to buy another on this subject for some time.

SCIENTIFIC PRINCIPLES IN NURSING. M. Esther McClain, R.N., B.S., M.S. The C. V. Mosby Co., St. Louis, 1953, $3.50.

This second edition of a valuable work on nursing strikes the reviewer as excellent in all respects. A valuable feature is a list of questions at the end of each chapter. Any physician who is setting examination papers for nurses could use these questions as part of his papers. That is merely an incidental virtue of the book. It ought to be read by all doctors who have professional contact with nurses.

HEADACHES—THEIR NATURE AND TREATMENT. Stewart Wolf, M.D. and Harold G. Wolff, M.D. Little, Brown and Co., Boston, 1953, $2.50.

This very interesting volume is written for public consumption. It deals with the various types of headaches with which all physicians are well acquainted. Probably the exception is histamine headache. The book has a somewhat psychological flavor, of necessity. It can be recommended to intelligent patients suffering from headache.

MEDICAL PROGRESS (1953). Morris Fishbein, M.D. The Blakiston Co., New York, 1953, $5.00.

Fishbein has obtained the services of an imposing array of medical talent to tell us what progress has been made in medicine in 1952. The various departments of medicine are well covered. Fishbein's summary is valuable. In fact, this volume is as good a "Year Book" as we have seen and more critical and discriminating than many of them.

SECOND ANNUAL REPORT ON STRESS. Hans Selye and Alexander Horava. Acta, Inc., Medical Publishers, Montreal, Canada, 1953.

This 500 page volume is essentially a reference work for all the scientific articles which have appeared within the past few years on the title subject. This gathering-together of experimental and clinical information concerning the effects of stress on the organism constitutes the most valuable feature of the book. Yet Selye's restatements of his profound theories of the general adaptation syndrome and its complicated mechanisms are even more interesting and commanding and, in themselves, make the book a valuable one. It is generally held at the present time that every well-characterized specific disease must of necessity have its own specific course. But the in-

cisiveness of Selye's revolutionary concepts is illustrated by the fact that *he disagrees with this view*. He feels that most disease-producing agents are "conditionally acting pathogens" and produce disease only under special circumstances of sensitization. It is apparently true that Selye is the first man in medical history whose effort to outline "a unified theory of medicine" will command attention and respect. His further efforts along this line will be watched with the most unusual interest.

FAMILIAL NONREAGINIC FOOD-ALLERGY. Arthur F. Coca, M.D., Charles C. Thomas, Springfield, Illinois, 1953, $10.50.

Familial Nonreaginic Food-Allergy is, according to the author, who coined the expression, a form of allergy to certain foods, drugs, metals, or inhalants, in which antibodies cannot be demonstrated in the blood, but in which the offending material produces some degree of pulse-rate increase soon after its ingestion or insufflation. It is, therefore, tested for by means of carefully examining the pulse rate, following the eating of certain suspected foods, etc., a procedure requiring a well-trained technician, inasmuch as a physician usually does not have time to do it. By detecting foods or other substances which produce an increase in pulse rate and eliminating them completely, allegedly remarkable results have been obtained in many patients and also in many diseases not previously considered to be allergic in origin. Headache, certain skin eruptions, indigestion and even peptic ulcer, essential hypertension, certain ill-effects of tobacco, and dysmenorrhea are likely to respond favorably to such eliminations.

The question even arises, according to the author, as to whether or not multiple sclerosis is a manifestation of this kind of allergy, inasmuch as many cases of the disease have been kept in remission by applying such eliminations. There may also be some relationship between this kind of allergy and the development of cancer (*?*).

Such a book as this must appear to any reviewer as highly controversial. It must be admitted that Coca writes in a common-sense sort of style and one cannot read the book carefully without becoming at least interested in the problems (and solutions*?*) which it presents. Such a reading (as well as reading of myriads of articles by other allergists) brings up the question as to whether or not *allergy* is the beginning and the end of medicine as a science. The conservatism of the medical profession naturally will view with skepticism many, if not most, of the conclusions and suggestions offered. Some physicians will positively rebel against the alleged breadth of scope covered by this theory and technic. Since almost anything is possible, however, and since Coca does not arm what he regards as truth, the book does not smack of quackery. Since it is very interesting it should be read by open-minded physicians, but not necessarily accepted without considerable personal experience of the method.

MISTAKES IN CLINICAL DIAGNOSES. M. Buerger (Klinische Fehldiagnosen). Georg Thieme Verlag, Stuttgart, 1953, 480 pages, 209 illustrations, some of them in colors. Price $13.90.

This is one of the most instructive books which has come to the attention of the reviewer. Only a physician of the widest experience and the greatest knowledge is willing to admit to an erroneous diagnosis. Buerger has written a book, in which he discusses the mistakes made in order that we avoid them in our own practice.

The first part of the book deals with the general concept of diagnosis, especially with the early recognition of diseases. He emphasizes that the therapy, either in improving or aggravating the condition, is able to clear up some cases. The second part of the book deals with the pathology in 21 chapters, according to different organs. On the basis of 170 cases he discusses the different diseases and the wrong interpretation of their symptoms. The wrong diagnosis is put opposite the correct one as a heading at the beginning of each case. Based on these cases, he discusses the reason for missing the diagnosis and the pitfalls. All laboratory and roentgenological findings are given. The roentgenograms are very illustrative. The surgical and autoptic observations are shown in illustrations.

The book is very well written. The case reports are clear, containing all necessary data. The illustrations are of excellent quality. There are foot notes on every page giving the bibliography for further study.

We can recommend this book very highly to all clinicians and general practitioners. They will enjoy reading it. Buerger can be congratulated on his publication and for his courage in writing such a book.

Franz J. Lust.

THE INCIDENCE OF PEPTIC ULCER IN DENMARK. Gunnar Alstead, M.D., Danish Science Press, Ltd., Copenhagen, Denmark, $2.25.

The present volume, which has the distinction of carrying prefaces by Frandsen and also by Meulengracht, deals with a statistical study of the clinical incidence of gastric and duodenal ulcer in the Danish population between 1940-1948. The study shows clearly that there has been a constantly increasing incidence of duodenal ulcer, especially in young persons. Furthermore, gastric ulcer also has increased in younger men, for the first time. The lowest incidence of the disease is in middle aged farmers. (English studies confirm this). Nevertheless, between 1940 and 1948, there is the greatest comparative increase in ulcer in agricultural workers. *The highest ulcer rates observed were in physicians.* Cigarette smoking is blamed for some of the increased rates of incidence. Strangely enough, Alstead thinks that wearing tight belts in younger men has an unfavorable etiological influence. Like other writers, he blames the rising rate of increase chiefly upon the present unstable social and political conditions of the world.

DADOS ANATOMICOS SOBRE O PILORO ILEO-CECO-COLICO. Liberato Joao Affonso Di Dio. Faculty of Medicine of the University of Sao Paulo, Brasil, 1952.

This is an extremely careful anatomical study of the ileo-cecal valve in the living subject. The author compares it to the pylorus. He also makes the point that there is a protuberance or "papilla" closely resembling the cervix uteri which should be shown in all future anatomical text books.

AMER. JOUR. DIG. DIS.

GENERAL ABSTRACTS OF CURRENT LITERATURE

GABE, M.: *Histophysiological findings in acute histamine intoxication after oral administration. (Donnees histophysiologiques sur l'intoxication histaminique aigue par voie gastrique).* Arch, mal. app. dig. 41, 1, 10. January '52.

Contrary to the opinion generally held, intragastric administration of histamine (300 mg/Kg) to the guinea-pig results in acute intoxication which is rapidly fatal. Histologic study of various organs at several stages of the intoxication reveals lesions, certain of which such as congestion of the abdominal viscera and cytologic modifications of the digestive glands are the same as occur following injection of histamine. After intra-gastric administration, splenic contraction occurs only after a period of intense congestion; similarly, the well-known dilatation of the pulmonary alveoli is preceded by extensive congestion of their walls.

Cytologic modifications of the gastric glands (extrusion of secretory granules by the chief cells) occur simultaneously with extensive leucocyte infiltration of the stomach walls. The leucocyte infiltration recalls in its intensity the phenomenon of diapedesis which occurs during the course of normal digestion.

In addition to these histologic modifications, the stomachs of guinea-pigs subjected to direct administration of adequate doses of histamine dihydrochloride show successive stages of ulcer formation, terminating in perforation in all animals surviving for long enough periods of time (4 to 5 hours). The earliest stages of this process are evident in the rupture of subepithelial capillary-ares and in sloughing exfoliation of the surface epithelium. The glandular region becomes denuded and is attacked by hyperacid and pepsin-rich gastric juice, the secretion of which is stimulated by histamine. The ulcer involves the deeper layers; the parietal cells are more resistant than the duct cells. The *muscularis mucosae* and the muscle layer proper become involved during the 4th hour of the syndrome, and perforation, which may be single or multiple, results generally during the 5th hour.

These facts support the concept of a double mechanism, partly vascular and partly peptic, in acute ulcer formation due to histamine.

EVANS JON A.: *Sliding hiatus hernia.* Am. J. Roent. Rad. Th. 68, 5, 754. Nov. 1952.

The opinions of the older anatomists regarding the distal esophageal segment have been reviewed together with the recent anatomical observations of Lerche. The difficulty in the differential roentgenographic diagnosis between the clinically important small sliding hiatus hernia and the clinically unimportant small supradiaphragmatic dilatations have been stressed. It has been shown that the distinguishing differential feature is frequently not made on roentgen anatomy alone but rather on the recognition of a physiological defect; namely, the demonstration of incompetence of the gastric cardiac spincter with reflux of barium into the distal esophagus. Early diagnosis has been emphasized. Attention has been drawn to the similarity in the roentgen appearance of the late stage of reflux esophagitis and stenosing carcinoma.

Franz J. Lust.

LOENNERBLAD, LARS. *Transit time through the small intestine. A roentgenological study on normal variability.* Acta Radiologica. Suppl. 88. pg. 85. 1951.

The review of the literature reveals that data concerning the transit time through the small intestine are rather divergent. Only a few authors have studied large series of normals. Using a uniform technique, the author observed a series of one year olds, another of 9-10 year olds, and a third of 18-25 year olds. For these age groups the mean transit time was approximately $2\frac{3}{4}$ hours in the one year olds, $2\frac{1}{2}$ hours in the 9-10 year olds, and almost 3 hours in the 18-25 year olds. The transit time has a somewhat varied distribution. Transit times of 30 minutes and less were observed in healthy individuals. A group of thirty children, 9-10 years old who had been given a comparatively small amount of contrast suspension the first time showed a statistically significant prolongation of the transit time, as compared to a second examination and to the rest of this age group. Emotional factors (fright, apprehension) could not be shown to influence the transit time markedly. On the other hand, the standard deviation of a single determination could amount to about one hour. This implies that the transit time could vary as much as one to five hours without there being any appreciable change in the emptying time of the stomach.

One chapter is devoted to the pattern and segmentation of the small intestine. Loennerblad's roentgenograms of this portion of his paper are very instructive, dealing with healthy persons. In newborns, the barium shadow of the jejunum is fairly even and it has no marked plicae conniventes. The barium is separated into small boluses of varying width. In older children, a coarsening of the folds was observed. In a few cases of each age group, distinct fluid levels in the small intestine were seen in healthy individuals. No explanation would be given.

Franz J. Lust.

HILLEMAND, M. P., MAFFEI, L. D. AND HILLEMAND B.: *Late Results of Gastrectomy for Ulcer.* Arch. mal. app. dig. T41, No, 7, 8. July-Aug. 1952.

When gastrectomy was substituted for gastro-enterostomy, after a first moment of considerable vogue, it was realized in specialized wards, that a certain number of operated patients were affected by various complications: localized (on the gastric stump, the stoma, or the jejunal loop) or affecting the general state of health.

It was to establish the percentage and the frequency

of these complications that the authors studied the late operative sequences of 312 subjects, after a delay of 2 years: 169 cases were followed up and examined. All were ward patients and had been operated upon by various surgeons; 103 cases out of 169 were more or less displeased with the result of their operation.

Among the *local complications,* gastritis and stomatitis were noted in 16 patients; peptic ulcer was observed in 10 cases; the most frequent complication was overflow in the afferent loop: this was observed in a total of 24 patients.

Gastric intubation was effected in 99 cases and showed in 91 patients that gastric acidity was considerably lowered; in 34 patients intubation was the means of revealing biliary overflow in the stomach. This overflow seems responsible for a great number of cases of gastritis; this complication seemed in most cases related to atonic stoma, as was verified by gastroscopy. It seems possible that biliary overflow is in relation with an imperfect anastomosis.

The part played by the stitching material in the genesis of all these local accidents was looked into without any definite result.

Dumping syndrome was noted 34 times. In 24 of these cases, there had been no operative after-treatment.

The authors were struck by the important number of *general complications* following gastrectomy: the frequency of these complications is higher than that of local distress.

Light cases of hypochromic anemia were quite frequently encountered; in these benign cases anemia seemed independent of gastric chlorhydria; the medullar count was never modified.

Light decalcification of the bones was found in 30 cases; there seems to be no definite relation in between deficient calcic absorption and the diminution of gastric acidity.

Tuberculosis of the lungs was quite frequently observed, sometimes, as a recurrence, in patients anteriorly affected by this trouble, sometimes, on the contrary, tuberculosis developed after the operation. Out of 29 cases, in which pleurisy or signs of apparently healed lung tuberculosis were present prior to the operation, 3 patients ultimately died, 1 developed an evolutive tuberculosis, 3 presented fibrous tuberculosis.

The measure of total protidemia and of the serin-globulin fraction was affected in 57 cases only; protidemia was lower than 70 grammes per liter in 5 cases; the serin-globulin fraction was inverted in 3 cases. But, as Fauvert and his collaborators have shown, too much importance must not be attached to these results: to be of some value, protidemia must be studied in relation with the total circulating plasma.

In an important number of patients (35 out of 103) genital trouble was evident, characterized by loss of sexual desire. No valuable explanation has been given of this trouble.

Mental distress was observed in 38 subjects: it was characterized by the aggravation of a pre-existent state of anxiety or by post-operative symptoms of depression.

The post-operative working capacity was low. 78 patients (60%) had been obliged to restrain their professional activity or change profession: an important social problem is thus set.

On the whole, in ward practice, the results of gastrectomy are not very good; they are better in town practice. This is probably due to the fact that most of the ward patients cease post-operative treatment much too soon.

To conclude, the amelioration of results seems to depend on very precise operative indications; these must take in count the unfavorable conditions due to the existence of lung lesions, even when benign, or of psychological trouble, as well as anemia and low protidemia. One also should operate upon those cases only which do not favorably react to medical treatment.

A perfect operative technique is a most important factor: most local accidents are due to a faulty operation. Should the different types of operations be taken in account, it seems that Pean's operation must be eliminated, and that Finsterer's technique gives less trouble than Polya's.

Post-operative treatment is also very important; but this treatment is not all and it is indispensable that the operated patient should be regularly examined for lung, blood or hepatic trouble.

The observance of these rules of rigorous technical indications and of prolonged post-operative treatment will, it is hoped, augment the proportion of satisfying results. Gastrectomy, in spite of its defects, and the mutilation it provokes, is, on the whole, one of the best of the operations proposed to treat gastro-duodenal ulcer.

GERSHON-COHEN, J., LEVINE, S. AND HERMEL, M.D.: *Retroperitoneal pneumography by injection of oxygen into the presacral space.* Am. J. Roentgen., Rad. Ther. and Nuclear Med., 68, 3, Sept. 1952, 391-394.

By injecting about 300 c.c. of oxygen into the presacral space, the oxygen finds its way rapidly throughout the retroperitoneal region, at which time x-ray films may give outlines of kidneys, liver and spleen. Retroperitoneal tumors and adrenal neoplasms may be diagnosed by this means.

ARDEN, F.: *Abdominal pain in infancy.* Med. J. Australia, July 26, 1952, 116-117.

Apart from the surgical emergencies, the commonest cause of abdominal pain in infancy is hunger, due to underfeeding. Overfeeding is a much less common cause of pain. Gas has been over-rated as a cause of abdominal pain. Dietary indiscretions and intestinal infections are basic causes of colic. Overexcitability is, next to hunger, the greatest cause of abdominal pain in infancy, and the author thinks this is on the increase because of the way people live today.

HILL, E. J.: *Mixed cell tumor (salivary gland) of the lip: case report.* Harper Hosp. Bull., 10, 4, July-Aug. 1952, 119-120.

Mixed cell tumors of the salivary glands are occasionally found in locations other than the glands themselves and the author describes such a case, in which the mixed-cell tumor occurred on the upper

lip. Such tumors have been found in many locations of the body, and the literature of the past 10 years contains 26 such cases. The most likely explanation for the phenomenon is that these are merely embryonal rests of ectodermal and mesodermal tissue. The treatment is wide surgical excision and recurrence is unlikely.

McMAHON, J. M.: *Functional cause of dysphagia.* Amer. Pract. & Dig. Treat., 3, 9, September 1952, 744-748.

The author deals with globus, diffuse spasm of the esophagus and cardiospasm, devoting greatest attention to cardiospasm. At present the use of hydrostatic dilator is considered the best treatment for the majority of cases of cardiospasm. Psychotherapy is often beneficial. Operation occasionally must be resorted to. Adrenergic blockade is said to be useful, employing Dibenamine.

HEINEKEN, T. S.: *A new cholinergic blocking agent in the treatment of duodenal and gastric ulcers.* Am. Pract. & Dig. Treat., 3, 9, Sept. 1952, 701-705.

Prantal (Schering) in therapeutic doses does not produce undesirable atropine-like side effects. It causes marked reduction in gastric acidity and motility and there is a wide margin of safety between the parasympatholytic and the toxic doses. In 25 out of 26 cases the drug produced rapid symptomatic relief. X-ray evidence of healing of the ulcers was satisfactory in most cases. It will require several years properly to evaluate such a drug, but the initial effects are good.

WOLLUM, A. AND POLLARD, H. M.: *Medical management of chronic ulcerative colitis.* Am. Pract. & Dig. Treat., 3, 9, Sept. 1952, 717-721.

The basic medical treatment of chronic ulcerative colitis is—rest, a diet high in protein and calories, vitamins, iron, blood transfusions, sedatives and antispasmodics. The antibiotics and sulfonamides are valuable in controlling the infectious complications. Psychotherapy has a place, since most patients have a personality disorder.

BECKER, J. W.: *The etiology of chronic ulcerative colitis.* Harper Hosp. Bull., 10, 4, July-Aug. 1952, 120-122.

Becker advances a hypothesis for the pathogenesis of chronic ulcerative colitis which supposes an initial psychological disturbance or conflict (anger, fear, resentment, apprehension) leading to functional impairment and hyperperistalsis of the colon, upon which basis ulceration may occur from micro-organisms or enzymes, particularly lysozyme.

VAL DEZ, F. C. AND SCHWEITZER, I. L.: *Diagnosis and treatment of amebiasis.* Am. J. Proctology, 3, 3, Sept. 1952, 177-181.

It is emphasized that amebiasis may exist without dysentery, and that amebic hepatitis is difficult to diagnose early, although pain in the liver and the modern, refined complement fixation reactions are helpful, whereas liver function tests are useless. Proctoscopy is an important element in diagnosis. Emetine is valuable in hepatic amebiasis. In intestinal amebiasis, the authors use carbazone for 7 days, followed by Vioform for 10 days. Aureomycin and terramycin reduce complications.

CANTOR, A. J.: *Bowel management of postoperative care of anorectal wounds.* Am. J. Proctology, 3, 3, Sept. 1952, 204-210.

An extensive comparison of psyllium preparations with mineral oil, has left no doubt in Cantor's mind of the great and superior advantages of the former in cases of operation in the rectum.

SHANKS, R. A. AND STUDZINSKI, L. P.: *Bact. coli in infantile diarrhea.* Brit. Med. J., July 19, 1952, 119-123.

Of 164 cases of infantile diarrhea, 6 yielded specific pathogens (Sh. sonnei or Salm. typhi-murium) and 35 yielded the alpha strain and 14 the beta strain of Bact. Coli in profuse or moderate growth on admission to hospital. None of the controls yielded profuse or moderate growth of either strain. Both strains were more frequent in the severer cases. Little difference was noted in treatment with chloramphenicol, sulfonamide and/or penicillin, or terramycin. The causal connection between the strains mentioned and the disease was not proved.

FOX, J. R.: *Observations and therapy of peptic ulcer in young adults.* Journal-Lancet, 83, 8, August 1952, 361-363.

Fox has, for several years, as head of the Students' Health Service, University of Minnesota, had the opportunity of observing peptic ulcer in young adults. In an average University population of about 20,000, with a ratio of 2 to 1 in favor of males, the average number of peptic ulcer patients seen per year was 39. A majority occurred in students of the professions, although the academic registration was several times the professional registration. He followed 83 cases over a period of time, 81 being duodenal and 2 gastric ulcers. There were 7 cases with bleeding, but none with perforation. Psychotherapy did not improve the physical status, even when tension factors were recognized. The patients did better on liberal diets than on restricted diets, but a smooth diet was suggested. Cutting out tobacco often did more harm than good. Frequent feedings were of value. Aluminum hydroxide tablets, sedatives and antispasmodics were used. Banthine alone often proved sufficient. Periods of stress, such as final examinations, often produced recrudescence of symptoms. After graduation, many persons improve greatly.

LILIENFELD, M. C. C.: *The treatment of constipation in pregnant women.* Am. Pract. & Dig. Treat., 3, 8, August 1952, 638-639.

The crystalline pure glycosides of senna (available as Glysennid, Sandoz Pharmaceuticals) namely, sennosides A and B, were found excellent in treating the common constipation of pregnant women, and produced no griping or side effects of any kind. One or two tablets daily sufficed.

SODEMAN, W. A.: *Current therapy of dysenteric and diarrheal amebiasis.* Am. Pract. & Dig. Treat., 3, 8, Aug. 1952, 640-641.

Studies of the effects of terramycin in the treatment of dysenteric amebiasis indicate that this drug may replace the more toxic emetine. It controls the dysenteric phase promptly and earlier ambulation is possible. Similar results have been reported using aureomycin. With either drug, as in the case of emetine, parasitological cure is not assured, and stool follow-up is necessary so that another amebacide may be given when needed.

EARNSHAW, P. A.: *Medical causes of abdominal pain during childhood.* Med. J., Australia, July 26, 1952, 117-119.

Earnshaw enumerates a long list of causes of abdominal pain in childhood and deals briefly with each one. Among them may be mentioned improper mastication of food, overeating, too much roughage, hairballs, and other foreign bodies, constipation, worms, primary peritonitis, hepatitis, unexplained abdominal crises in children with nephrosis, pneumonia, enlarged mesenteric lymph glands, ketosis due to excessive fat intake, measles, filariasis, plumbism, laxatives, iron and the sulfonamides. Finally hysteria as pure malingering must be kept in mind.

STROHL, E. L. AND STANGER, J. V.: *Endometriosis of the umbilicus.* Illinois Med J., 102, 3, Sept. 1952, 208-210.

The authors describe a tumor in a 44-year-old white female which was found microscopically to be endometriosis. Theories as to the cause of endometriosis are discussed. The world literature contains 107 cases of endometriosis of the umbilicus, the present case bringing the total to 108 cases.

TURNBULL, R. B., JR. AND BROWN, C. H.: *Carcinoma of the colon in chronic ulcerative colitis.* Cleveland Clin. Quart., 19, 4, Oct. 1952, 166-170.

This is a report of two five-year survivals after operation for cancer of the colon in 2 cases of chronic ulcerative colitis. Neither of the patients had polyps or pseudopolyps. Usually colonic carcinomas in colitis metastasize prior to the operation. The authors make a plea for subtotal colectomy in protracted cases of chronic ulcerative colitis, and also where polyps or pseudopolyps are present.

BROWN, C. H. AND HOERR, S. O.: *Marginal ulcer following gastric resection for benign gastric ulcer.* Cleveland Clin. Quart., 19, 4, Oct. 1952, 213-218.

It is rare for a marginal ulcer to develop following a gastric resection for *gastric* ulcer, but such a case is presented in which the marginal ulcer, demonstrated by x-ray, healed completely by intensive medical treatment.

GOLDMAN, M. A. AND ENGBRING, G. M.: *Obstructive jaundice due to remote metastases.* Illinois Med. J., 102, 4, Oct. 1952, 268-270.

The authors report a case of extrahepatic biliary obstruction due to metastases from a clinically "cured" carcinoma of nasopharynx to the hilus of the liver. Preoperative diagnosis was impossible. In a patient who is known to have or had been treated for a malignant neoplasm outside the hepatobiliary system, the advent of icterus poses an important diagnostic dilemma. Evidence of extrahepatic obstruction usually is held to indicate unrelated disease of the biliary tract or pancreas, but the present case shows how unreliable such reasoning may prove to be.

ST. JOHN, L. A. AND TAMONEY, H.: *Partial intestinal obstruction caused by an intraduodenal septum.* Am. J. Dis. Child., 84, 4, 439-441.

This is a report of the case of a 2-year-old infant with partial intestinal obstruction since birth. Difficulties in diagnosis were obvious and operation finally disclosed a septum within the duodenum with an extremely small opening in it. The septum was removed and duodenostomy performed. Now, at 3 years of age the child is normal and is having no recurrence of the original trouble.

SCOTT, G. E. M.: *A note on fibrocystic disease of the pancreas.* Med. J. Australia, Nov. 29, 1952.

Scott presents some evidence to show that fibrocystic disease of the pancreas is no more a disease *sui generis* than is chronic pancreatitis, of which it appears to represent a variant. The irregular size of the lumina of acini results from coalescence of these units, in pairs or groups, due to atrophic lesions in the cells of the acini, in combination with the laying down of fibrous tissue between and around them, in interlobular and intralobular distribution. General malnutrition of the organism may be of considerable importance in the disease.

BRACKIN, J. T., MILLER, J. M. AND BELL, W. H.: *Roentgen appearance of the small intestine in tuberculous peritonitis before and after streptomycin therapy.* Am. J. Roentgen., Rad. Ther. and Nuc. Med., 68, 6, Dec. 1952, 887-893.

Three cases of peritoneal tuberculosis are presented in which the small intestine showed delayed motility, segmentation of the barium meal, loss of the normal outlines of valvulae conniventes and dilatation of segments. Following streptomycin therapy, the patients became symptomatically normal and the changes noted in the small bowel gradually disappeared, finally leaving a normal x-ray appearance.

BERGER, I. R., GADDIS, J. W. AND PIRKEY, E. L.: *Cholecystography.* Am. J. Roentgen., Rad. Ther. and Nuc. Med., 68, 6, Dec. 1952, 900-902.

Priodax was compared with a new "benzoic acid derivative," as cholecystographic media, in 50 patients. Although the medium produces fewer side-effects, Priodax gave more consistent visualization of the gallbladder. Hence, the new agent offered no definite advantages over Priodax.

LILLY

Eli Lilly and Company is supplying most of its pulvule specialties and all of its 'Enseals' (Timed Disintegrating Tablets, Lilly) in new forms that identify them as Lilly products.

Lilly pulvules (filled capsules) have a new parabolic end which gives them a distinctive bullet-shaped appearance. The old pulvule was rounded on both ends.

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Among the more widely used medicines being supplied in parabolic-end pulvules are 'Lextron' (Liver-Stomach Concentrate with Ferric Iron and Vitamin B Complex, Lilly) and the other liver-stomach concentrate formulas; 'Beconin with Vitamin C' (Vitamin B Complex with Vitamin C, Lilly), 'Prenalac' (Prenatal Nutritional Supplements, Lilly), 'Reticulex' (Liver, B_{12}, Iron, and Vitamins, Lilly), 'Seconal Sodium' (Secobarbital Sodium, Lilly), and 'Bilron' (Iron Bile Salts, Lilly).

'Enseals' to be gelatin-flecked contain many medicaments, among which these are widely used: ammonium chloride, sodium salicylate, ferrous sulfate, diethylstilbestrol, potassium thiocyanate, and the thyroid formulas.

Patents are pending on the new identifying characteristics.

CIBA PRIZES

Ciba Pharmaceutical Products, Inc., of Summit, N. J., announced today it will present five prizes of $100 each to the outstanding junior or senior year specialist in the five departments of the Division of Science of Drew University of Madison, N. J.

In the hope of encouraging promising young men and women to enter the field of science professionally, Ciba presents the annual prizes to students at Drew. The University, a near neighbor of Ciba, has graduated many outstanding science majors, some of whom are now employed with Ciba.

The purpose of the prizes is to encourage and recognize superior achievement in the fields of Botany, Chemistry, Mathematics, Physics and Zoology. Science Department heads, together with the student personnel officer and the Dean of the University, choose the best qualified student from each of the five departments of the Division of Science. The choices are made on the basis of scholarship and the students' participation in other curricular and extra-curricular activities. To be eligible for a Ciba prize a student must be a junior or senior year major in the Division of Science and must have a scholastic average of at least 2.00. No student can win a prize more than once.

The prizes will be presented at the Honors Convocation at the University to be held on May 11.

BIOCHEMISTRY

"General Biochemistry," a new book that balances the dynamic aspects of the subject against a structural background, was published in April by John Wiley & Sons. Written by Joseph S. Fruton and Sofia Simmonds, the volume supplies not only the principles but also the factual material drawn from studies with plants, microorganisms, and animals.

In the first section of the book, which deals with protein chemistry, the authors emphasize the central place of proteins and enzymes in the chemical activity of living matter. They then cover the general properties of enzymes, and of equilibria and rates in enzyme-catalyzed reactions, giving special attention to the important role of the catalytic proteins in metabolism and sketching the elementary principles of thermodynamics and kinetics as applied to biochemistry.

A consideration of the problems of biochemical dynamics constitutes the major portion of the volume, with special reference made to biological oxidation and the intermediate metabolism of lipids, proteins, and carbohydrates; individual enzymes and coupled enzyme-catalyzed reactions are stressed under the last heading. In a final section on the general aspects of metabolism, Fruton and Simmonds cover the efforts that have been made to relate the metabolic role of inorganic ions, of hormones, and of vitamins to known enzyme-catalyzed reactions.

Both authors are at Yale University, Professor Fruton as chairman of the department of biochemistry, and Dr. Simmonds as assistant professor of biochemistry and microbiology.

"General Biochemistry," a 940-page book, is priced at $10.00.

WINTHROP REMOVES DILUENT FROM VITAMIN PREPARATION

A new packing of Betasymplex "Niphanoid," omitting the diluent, is announced by Winthrop-Stearns Inc., for immediate distribution throughout the country.

The product is an injectable, highly concentrated mixture of synthetic vitamin B complex factors, including B-12. The special packing is especially intended for the use of hospitals preferring their own distilled water.

WARBURG APPARATUS

E. Machlett & Son announces the addition of a new series of Warburg Apparatus—known as the Bronwill series—to their varied line of manometric research instruments.

According to Machlett, the Model USL—most versatile of the series—attains, automatically, temperature constancy of ± 0.005° C corresponding to a pressure variation in the reaction vessels of only 0.01 mm column of water. This is achieved by its efficient circulatory system and supersensitive, lagless contact thermometer which operates immersion heaters through an electronic relay.

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perfect duplication of the most exacting work—is assured by the unique and superior construction of the apparatus. Mechanism operates entirely on highly accurate, machined cams and gears; no belts of any kind are used to drive the unit.

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PHARMACY GRADUATES TOLD THEY CAN EXPECT DEVELOPMENTS IN MEDICAL RESEARCH "AS STARTLING AS ANY IN THE PAST"

College of Pharmacy graduates at the University of Michigan were told that they can expect new developments in medical research "as startling as any in the past."

John A. McCartney, trade relations manager for Parke, Davis & Company, said at the graduation banquet in the Michigan Union Building that these new developments were "certain" to result from the "concentration of virtual armies of pharmaceutical researchers upon the problems of cancer, heart disease, renal dysfunction, poliomyelitis and the infirmities of old age."

He told the graduates, "The changes in pharmacy in the next 10 years will be many. But, through them, will run the same old background theme — the importance, first of all, of serving people of our communities to the very best of our professional abilities; cooperation with members of other health professions in the constant fight against disease and death; a continuing search for new and better therapeutic weapons; and the constant necessity of preparing ourselves for greater responsibilities."

PARKE, DAVIS & COMPANY OPENS NEW BRANCH OFFICE, PRODUCTION LABORATORY IN HAVANA

Detroit.—Parke, Davis & Company has opened a new 25,000 sq. ft. branch office and manufacturing laboratory in Havana, Cuba, it was announced recently by W. R. Jeeves, vice president and director of overseas operations.

The new facilities, located on Avendia 20 de Mayo, mark a vast expansion of Parke-Davis operations in Cuba, where the firm has had a branch office since 1916.

Opening of the new Havana branch is the latest step in a Parke-Davis expansion program in Latin America. Last month, the firm open-

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Thiamine HCl (B_1)	10.0	mg.
Riboflavin (B_2)	5.0	mg.
Pyridoxine HCl (B_6)	1.0	mg.
Panthenol, equivalent to of calcium pantothenate	10.0	mg.
Vitamin B_{12} U.S.P. (crystalline)	2.0	mcg.
Folic acid	2.0	mg.
Nicotinamide	100.0	mg.
Vitamin E (as mixed tocopherols natural)	10.0	mg.
Inositol	30.0	mg.
Choline—from choline bitartrate	30.0	mg.
Biotin	0.1	mg.
d-Methionine	20.0	mg.
Cobalt—from cobalt sulfate	0.1	mg.
Copper—from copper sulfate	1.0	mg.
Fluorine—from calcium fluoride	0.025	mg.
Iron—from 4 gr. ferrous sulfate exsic.	76.2	mg.
Calcium—from dicalcium phosphate	165.0	mg.
Manganese—from manganous sulfate	1.0	mg.
Iodine—from potassium iodide	0.15	mg.
Molybdenum—from sodium molybdate	0.2	mg.
Potassium—from potassium sulfate	5.0	mg.
Zinc—from zinc sulfate	1.2	mg.
Magnesium—from magnesium sulfate	6.0	mg.
Phosphorus—from dicalcium phosphate	127.4	mg.

"CLUSIVOL"® CAPSULES

Multiple vitamin-mineral supplement

No. 293—Supplied in bottles of 100 and 1,000.

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for the patient who carries no weight

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[ORAL FAT EMULSION SCHENLEY]

• **provides extra calories**—150 per ounce, in easily utilized form, for quick gain in weight and strength

• **without excessive bulk**—no undue digestive burden...no reduction in appetite for other foods

• **or cloying taste**—delicious alone or with a variety of nutritious foods

In 16-oz. bottles.

SCHENLEY LABORATORIES, INC.
LAWRENCEBURG, INDIANA

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ed a large manufacturing operation in Buenos Aires, Argentina.

The modern, air-conditioned plant, which is equipped to produce the 1,000 medicinal products in the Parke-Davis line, will serve physicians and pharmacists throughout Cuba, Jeeves said.

Constructed of reinforced concrete, the new one-story structure is built to take an additional floor when such expansion is needed. The building contains offices, shipping facilities, finished stock warehouse and production laboratory.

Branch manager at Havana is O. Castagnet, while manufacturing superintendent is Dr. Orestes Lecuona.

Besides Buenos Aires and Havana, the company has Latin American branches and plants in Rio de Janeiro, Colon (Panama), San Juan, P. R., and Mexico City.

LILLY

Eli Lilly and Company announces the addition to its product list of Ampoules Solution 'Seconal Sodium' (Secobarbital Sodium, Lilly).

Ampoules No. 616, Solution Seconal Sodium,' provide a short-acting barbiturate in liquid form. Each cc. contains 'Seconal Sodium,' 50 mg. (¾ grain), in a solvent of water and polyethylene glycol. The product fills a need for a ready-to-use parenteral sedative and hypnotic drug for use by physicians in carrying out simple office procedures and in conjunction with treatment of patients in their homes. The solution also can be used as an adjunct to anesthetic procedures. Within the sedative and hypnotic range, by either the intravenous or intramuscular route, it will find application whenever a short-acting barbiturate is indicated.

It is of value in convulsive states and violent psychotic disorders, and it may be used in place of curare prior to electroshock therapy.

By the rectal route, Solution 'Seconal Sodium' provides basal hypnosis in children prior to surgical procedures and thus reduces the total quantity of general anesthetic required; in addition, it facilitates induction of and recovery from anesthesia itself.

The solution may be employed in dentistry as a sedative, as an adjunct to nerve blocks, and as a supplement to nitrous oxide. It antagonizes systemic reactions to local anesthetic drugs.

LILLY

New additions to the product list of Eli Lilly and Company are Ampoules Distreptocin Sulfate. Ampoules No. 651 contain 1 gm. and Ampoules No. 655, 5 gm.

Distreptocin is a mixture of equal parts of streptomycin and dihydrostreptomycin base, as the sulfates. It appears to have a distinct advantage over either streptomycin or dihydrostreptomycin alone, because the incidence of damage to the vestibular or auditory branch of the eighth cranial nerve is much less. As with streptomycin and dihydrostreptomycin, vestibular and auditory dysfunctions bear a relationship to dosage and duration of treatment; sufficiently large doses of distreptocin given over a prolonged period may produce the nerve damage mentioned.

The drug is packaged in the dry form and should be reconstituted for use with Water for Injection, U. S. P., a sterile isotonic saline solution, or some other suitable solvent.

Indications are identical to those of either of the individual components and include the following: urinary tract infections due to gram-negative organisms sensitive to streptomycin; gonorrhea which does not respond to penicillin therapy; tularemia; *Hemophilus influenzae* meningitis and pulmonary infections; wound infections due to streptomycin-sensitive organisms (applied topically); granuloma inguinale; chancroid infections due to *Hemophilus ducreyi* that do not respond to sulfonamide therapy, and tuberculosis (in combination with PAS).

POLIO

Detroit.—The announcement of the National Foundation for Infantile Paralysis that a new vaccine may soon conquer polio prompted this comment from Harry J. Loynd, president of Parke, Davis & Company, one of the world's largest manufacturers of pharmaceuticals:

"When the new vaccine meets

AMPHOJEL®

ALUMINUM HYDROXIDE GEL
WYETH'S ALUMINA GEL

In uncomplicated
PEPTIC ULCER
prompt healing may
be anticipated when
acid and pepsin
corrosion are halted.
"Double-Gel action" of
Amphojel provides
both local physical
protection and gentle
sustained antacid effect.

Wyeth®
Philadelphia 2, Pa.

the tests of safety and effectiveness in field trials, Parke, Davis & Company will be in a position to make it available at once."

He said Parke-Davis had been working jointly for many years with Dr. Jonas E. Salk of the University of Pittsburgh, who developed the vaccine which appears to produce immunity against all three strains of polio.

"This isn't the first time that Dr. Salk has made an important contribution to medicine," Loynd said.

He recalled Dr. Salk had developed the adjuvant used exclusively in the flu vaccine produced by Parke, Davis & Company. An adjuvant increases the potential effectiveness of a medicinal.

"A similar principle is being used in the new polio vaccine developed by Dr. Salk," the executive said.

For years, Parke-Davis has conducted a large research program in virus diseases, including polio. The program is headed by these top virologists: Dr. F. D. Stimpert, director of microbiological research; Dr. I. W. McLean, Jr., assistant director of microbiological research; Dr. A. R. Taylor, director of virus purification; and Dr. Arnold Hook, senior virologist in charge of tissue culture work.

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faster, more certain, more complete utilization

1. more certain absorption, particularly in conditions associated with poor fat absorption (dysfunction of the liver, pancreas, biliary tract and intestine).
2. faster recovery from deficiencies with speedier convalescence in medical and surgical patients.
3. 100% natural vitamin A, therapeutic activity proven by clinical use over many years (contains no synthetic A).
4. no fish taste or odor (special processing removes fish oils and fats); well tolerated even by sensitive patients.

Each VI-AQUA THERAPEUTIC CAPSULE provides:

AQUEOUS	
Vitamin A* (natural)	12,500 Units
Vitamin D* (calciferol)	1,000 Units
Ascorbic Acid (C)	150 mg.
Thiamine Mononitrate (B_1)	10 mg.
Riboflavin (B_2)	5 mg.
Vitamin B_{12}	2 mcg.
Niacinamide	100 mg.
Pyridoxine HCl (B_6)	1 mg.
d, Calcium Pantothenate	10 mg.
dl, Alpha-Tocopheryl Acetate (E)*	5 mg.

*oil-soluble vitamins made water-soluble with sorethytan esters; protected by U.S. Patent 2,417,299.

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DR. MARTIN REYES

Election of Dr. Martin Reyes, export manager of A. H. Robins Co., Inc., as vice president of A. H. Robins Inter-American Corp., has been announced by E. Claiborne Robins company. The A. H. Robins Inter-American Corp. is the export affiliate of the A. H. Robins Co.

"By this promotion we are able to recognize the good job that Dr. Reyes has done in making the distribution of Robins products worldwide," Hr. Robins commented.

Dr. Reyes is a member of the Export Managers' Club of New York and the Import-Export Club of Richmond and has been active in export trade for a quarter of a century. After attending schools in San Juan, Puerto Rico, and Pennington Seminary in New Jersey, he completed his professional education at the Medical Chirurgical College, Philadelphia.

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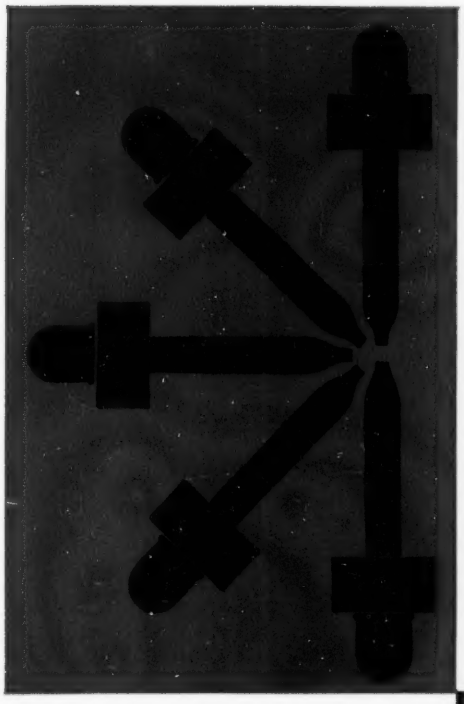


new convenience and economy in broad-spectrum therapy for your younger patients...

Terramycin

BRAND OF OXYTETRACYCLINE

pediatric drops

Each 10 cc. bottle contains 1.0 gram of pure, well-tolerated Terramycin, often sufficient as a *total* dose for the treatment of common infections of moderate severity in infants and small children. Each cc. supplies 100 mg. of Terramycin in raspberry-flavored, nonalcoholic vehicle. With specially calibrated dropper. May be diluted as required.

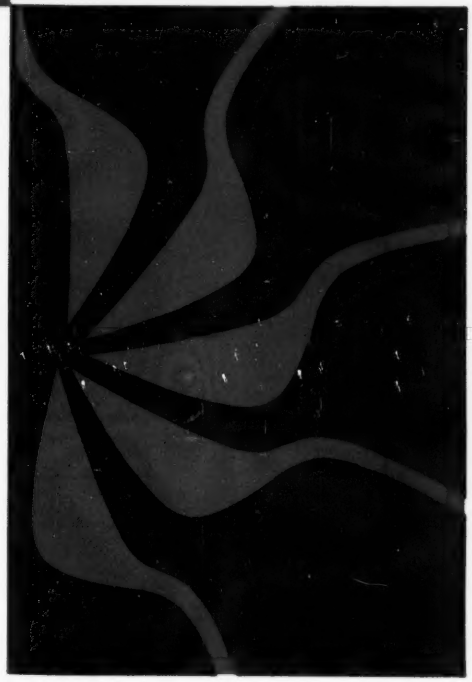
...with the same good taste distinguishing this favorite dosage form for older patients

Terramycin

BRAND OF OXYTETRACYCLINE

oral suspension

Bottles containing 1.5 gram of pure, well-tolerated Terramycin in raspberry-flavored, nonalcoholic vehicle. Each teaspoonful (5 cc.) supplies 250 mg. of Terramycin. May be diluted as required.



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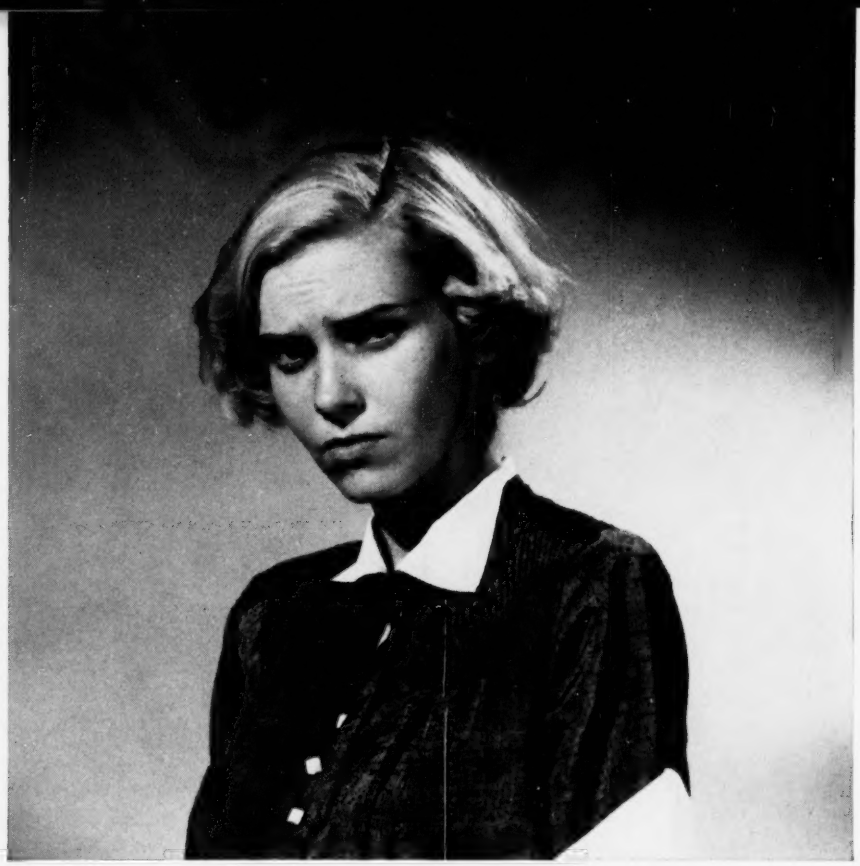

Various factors during pregnancy (intestinal displacement, atony, inactivity) make it virtually impossible for most women to go through the gestation period without constipation.

CONSTIPATION IN PREGNANCY:

Satisfactorily controlled with Metamucil®

Metamucil, with its physiologic principles of "smoothage" and "normohydration," is well tolerated for pregnancy constipation. This bland vegetable colloid may be used throughout the entire nine-month period without fear of forming a "habit" and without irritation to the mucosa.

Greenhill[1] suggests that Metamucil be given every other night. He also recommends Metamucil, in conjunction with a proper diet, during the lying-in period of the puerperium.

Metamucil is the highly refined mucilloid of Plantago ovata (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. It is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

1. Greenhill, J. P.: Principles and Practice of Obstetrics, ed. 10, Philadelphia, W. B. Saunders Company, 1951, pp. 103-104; 311; 332.

SEARLE Research in the Service of Medicine